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Original Articles

The Treatment of Eclampsia

By Brooke M. Anspach, M.D., William Gillespie, M.D., William D. Macon, M.D., W. Sinclair Bowen, M.D., P. Brooke Bland, M.D., John T. Altman, M.D.

It is well recognized by the medical profession that the condition known as eclampsia is as yet an unsolved problem in the sense that its etiological factors are well understood. Nevertheless the condition is one which every general practitioner meets, either because he is not put in charge of the pregnant woman until the last moment or because the eclampsia develops without warning.

It is noteworthy that whenever our knowledge of the cause of a disease, or severe symptom, is lacking, there is usually wide divergence of opinion as to how it is to be combated, with the result that different plans are evolved and recommended, and oftentimes the general practitioner is at a loss as to which plan to follow. For these reasons the Editors of the THERAPEUTIC GAZETTE have written to several teachers who devote themselves to obstetrics asking that they outline the plan they pursue, and in order that the problem may be put in concrete form have sent them the following questions. We think our readers will be interested in the views expressed in the answers which have been received.

1. Will you state your routine or generally used treatment of prepartum eclampsia?
2. Of eclampsia arising during labor?
3. Of postpartum eclampsia?
4. Is it your opinion, as stated by a recent writer in the *Boston Medical and Surgical Journal* of October 19, 1922, that accouchement forcé is to-day advised by no one?
5. What is your view as to the relative value of chloroform, morphine, and veratrum viride in full doses as sedatives in eclampsia?

By Brooke M. Anspach, M.D.,

Professor of Gynecology in the Jefferson Medical College of Philadelphia.

1. The most pressing indication in the treatment of prepartum eclampsia is to increase the elimination of waste products. Although the pregnancy is, of course, the underlying cause of the toxemia, the interruption of pregnancy as the first step in the treatment has not proved to be advisable; this is true because the anesthesia which is usually necessary for the removal of the pregnancy at one sitting will increase the toxemia, and the slower methods of inducing labor or abortion will not achieve their end for a number of hours, or perhaps until the patient has succumbed to the poison which is circulating in her blood.

The first step, therefore, is the adoption of methods which will increase the elimination of the toxic substances circulating in the blood. It not infrequently happens that the efforts made to increase elimination bring on labor pains, and the uterus often empties itself spontaneously. If this unhappily does not occur, then after elimination has been started labor should be induced. If the patient is not responsive to the elimination treatment, some rapid method of delivery will have to be undertaken.

Elimination of waste products may be attempted by stimulating the excretory activity of the skin, the bowels, and the kidneys.

Skin.—Elimination by the skin is promoted by the hot vapor bath, or if the

apparatus which is needed for this is not available, the hot pack. Drugs are not used to promote diaphoresis either as adjuvants to the hot vapor bath or the hot pack, or alone. Pilocarpine has been known to produce edema of the lungs when prescribed under these conditions. While the bath is in progress an ice-cap should be put upon the head and lukewarm water should be given freely by the mouth. If the patient cannot be made to swallow, the introduction of water by one of the other methods—subcutaneously, intravenously, by enteroclysis, or by gavage—will promote elimination by the skin.

Bowels.—To promote elimination by the alimentary canal, the bowels should be opened with a saturated solution of Epsom salt, and kept moving by a repetition of this purgative at regular intervals.

If the patient's condition is so bad that she cannot be made to swallow the solution of "salts," it may be given by gavage, or croton oil, or elaterium may be placed upon the back of the tongue.

If the attempted administration of a purgative is unsuccessful, then a high compound enema should be given (glycerin and Epsom salt ää ʒij, soapy water q. s. ad Oj) and repeated irrigation of the colon should be practiced.

Kidneys.—If the patient is able to swallow, sodium citrate in large dose should be given every three hours. Irritant diuretics must be avoided. Renal activity is promoted by the introduction of water into the circulation, subcutaneously, intravenously, or by enteroclysis. As there is some question relative to the effect of salt solution upon the kidneys, plain sterile water (under the skin) or soda solution (1 per cent intravenously if there is acidosis) by enteroclysis should be used. When the use of sodium citrate proves to be unsatisfactory and something more is demanded, certain drugs may be given hypodermically; thus if the blood-pressure and the pulse-pressure are low, digitalis or sparteine may be of value; if the blood-pressure and the pulse-pressure are high, caffeine may be given with good results.

Blood-pressure, Venesection, and Cardiac Stimulants.—If the blood-pressure is very high (above 180) and the pulse-pressure proportionate, venesection should be at once carried out, and about a pint of blood taken from the circulation. The exact amount to be removed may be judged by the effect of its removal on the blood-pressure. If there is a disproportionate increase of the systolic and diastolic pressure, and a lowering of the pulse-pressure, venesection, if done at all, must be undertaken with particular care. Although its action has been questioned by many authorities, veratrum viride is of value if the pulse is rapid, full, and bounding; the fluid extract should be given in full dose, 20 to 30 minims, followed by 5-minim doses until the pulse-rate is normal. It lowers blood-pressure and acts as a sedative to the nervous system.

Acidosis.—If an acidosis is present, bicarbonate of soda (1-per-cent solution carefully prepared) intravenously should be given in bad cases; otherwise, hyperdermoclysis with plain water or continued enteroclysis with bicarbonate of soda should be maintained.

Convulsions.—Convulsive seizures should be controlled by the hypodermic administration of morphia; chloral and bromides may be given by the bowel. Veratrum viride also is said to depress the nervous system. Suitable measures should be adopted to prevent self-inflicted injury during a convulsive attack; if a general anesthetic is required, gas and oxygen are preferable to chloroform or ether.

Delivery of Patient.—If it becomes evident that the efforts at elimination will not be successful enough to warrant further delay, then delivery of the patient must be made in that manner which appears for the individual case most rapid and at the same time least dangerous; when, in a primipara, the head is in the pelvis, the cervix is soft and offers no bar to rapid dilatation, labor may be induced, the cervix being dilated with a Voorhees bag. Labor should be terminated as soon as dilatation is complete by forceps or version. When the cervix is

long and rigid and delivery through the natural channel promises to be difficult, abdominal Cæsarean section should be at once undertaken.

2. Here again the first indication is to increase elimination. After this has been started, the completion of labor may be hastened by any safe operative procedure. For example, if the pains are weak and ineffectual, the introduction of a Voorhees bag to complete the dilatation and the use of forceps or version (in occipitoposterior position especially) are indicated; Cæsarean section at this time in cases which promise difficulty in delivery through the natural channels has been quite successful, so that even if no especial difficulty is probable and yet relief is urgent, and time appears to be a very important factor, a section should be undertaken.

3. The treatment of postpartum eclampsia comprises the measures to increase elimination already given. Postpartum eclampsia indicates a more dangerous degree of toxemia than either of the other forms. It is in this group that we find the toxemias based upon structural changes in the liver or the kidneys.

4. Accouchement forcé is to-day in disrepute. The term signifies rapid dilatation of the cervix, and immediate extraction of the child through the natural channels. The dilatation may be accomplished by branched metal dilators, or by dividing the cervix in the midline anteriorly as far as the lower uterine segment. All such methods are more difficult and more dangerous to both mother and child than abdominal Cæsarean section.

5. Of all these drugs, probably the most valuable is morphine. Chloroform should never be given as it sometimes causes degeneration of the liver cells. Nitrous oxide and oxygen are preferable. Ether is less dangerous than chloroform. Chloral and bromides stand next to morphine. The value of veratrum viride as an antispasmodic has been questioned, but there is much evidence that in suitable cases it is of great help.

By William Gillespie, M.D.,

Professor of Obstetrics, University of Cincinnati College of Medicine, Cincinnati, Ohio.

I am glad to comply with your request and answer the questions put in your recent communication.

With the advent of warning signs during pregnancy the patient is given citrate of soda grs. xxx every two, three or four hours, and sodium bicarbonate is given freely until the patient is thoroughly alkalinized.

Veratrum viride is given in sufficient doses to lower blood-pressure and slow the pulse, but so long as eclampsia does not appear to be threatened the dosage of veratrum used is moderate—gtt. xij of Norwood's tincture every two, three or four hours by the mouth. If the urine is scanty and the patient has headache or visual disturbances, veratrum is pushed to the point of nausea, even though the blood-pressure is not high, for experience demonstrates that a rapid rise of blood-pressure with convulsions may come on within a few minutes.

Milk and Vichy water is the only food given until the renal function is thoroughly reëstablished, when cereals are added.

If the signs point to immediate danger of a convulsion, veratrone is pushed to its physiological effects—that is, 30 minims given in the muscles of the thigh, followed by 15 minims every ten minutes until a full effect is produced. We judge this effect by Reamy's old rule, sighing respiration, copious bilious vomiting, and a soft compressible pulse of 60, 50 or 40 per minute. The vomiting should be free, and I regard the effect as inadequate if the emetic action is not continued for two hours. In this we follow the teachings of Dr. A. B. Isham, who believed that much of the beneficial effects produced by veratrum comes from its excessive stimulation of the hepatic function. If one of the chief functions of the liver is to remove toxic matter from the blood and destroy it, any one watching a patient after full physiological doses of veratrum cannot but be impressed with the enormous elimination produced. In

most cases where positive effects have been produced the subsidence of the vomiting is followed soon by free purgation of bile-laden stools. Even where small doses are given which produce no vomiting, observation of the stools will demonstrate to the satisfaction of any one an increased biliary output.

In prepartum eclampsia my whole attention is directed to the control of the seizures, and for this purpose nothing approaching veratrone in efficiency has been found. I usually give 60 minims immediately deep in the outer surface of the thigh, following with 15 minims every ten minutes until the full physiological effect of the drug is produced. My reason for starting with 60 minims is that very rarely will an efficient action of the drug be secured until at least one drachm has been given, and any convulsive seizure permitted to occur may produce a fatal cerebral hemorrhage.

Occasionally one sees a case in which 30 minims produces marked effects, but the permanency of relief obtained is less, and with recurrence of danger-signs one is apt to find that larger doses, and sometimes even very large doses, are required to produce effects, and while experimenting as to the dose required another convulsion may occur. Hence I give one drachm at least, even though less may produce temporarily all the signs of a full therapeutic effect. If the effect is produced but the vomiting of bile ceases in less than two hours, give more, and, having secured marked and long-continued effects, keep the pulse below 80 per minute. If it gets above 80 it may suddenly go to 120 per minute, become full and bounding, and a convulsion occur before your next dose can produce an effect.

Some of these cases will have labor precipitated by the eclampsia, and if the patient is thoroughly under the influence of veratrum, even if conscious, she is usually unaware of the pains until dilatation is far advanced, and if she is in a confused mental state the head of the child may be distending the pelvic floor before labor is suspected.

I never attempt to induce labor in an eclamptic patient. Such attempts serve only to increase the irritability of the nervous system. Induction of labor should be practiced when in spite of rest in bed, dietetic and medical treatment, it becomes apparent that the patient is drifting toward eclampsia. If eclampsia is positively threatened the starting of labor will precipitate convulsions. A wise course is to fight the eclampsia and induce labor after the height of the storm has passed.

We frequently hear it said that if the child is born or dies *in utero* improvement in the toxemic condition begins within forty-eight to seventy-two hours, and this is true. It is equally true that if convulsions are controlled and the child *in utero* lives, improvement in the patient's condition usually begins in forty-eight to seventy-two hours. In other words, even in patients who have been for a long time drifting into danger, if convulsions can be controlled there is a natural tendency to improvement in two or three days. If labor comes on spontaneously during this time it will be infinitely easier than induced labor.

After the violent storm is over the maintenance of a moderate veratrum effect by gtt. xv of Norwood's tincture by the mouth every four, three or two hours, according to the condition of the pulse, and a pushing of alkalies by mouth and rectum, will usually bring up the urinary output very rapidly. It is not uncommon to secure six or seven quarts of urine as a daily output. Many of the cases first seen in convulsions will under this treatment go on from ten days to seven weeks and be normally delivered without recurrence of convulsions. I have seen many a case tided over until the child arrived at a period of viability.

If the character of the urine continues bad in spite of the satisfactory output, it is our rule, after as thorough elimination as possible, to induce labor by the simple method of loosening the membranes from the lower uterine segment with the finger and to handle the case as a spontaneous delivery. If kept moderately under the influence of veratrum the patient does not

suffer as much as does a normal case. There are two points in the labor where a convulsion is apt to occur, just as the first pains of the expulsive stage are forcing the head through the almost dilated os and as the head is escaping through the vulvar orifice. The patient should be thoroughly relaxed and vomiting at this point of time in the delivery.

2. If eclampsia arises during labor the only modification of the treatment already outlined would be chloroform anesthesia and forceps delivery as soon as the first stage of labor is completed. In the first stage of labor chloral is administered in sufficient amount to obtund sensibility and produce sleep between the pains.

3. Postpartum eclampsia is also treated by veratrum in the same way as prepartum eclampsia.

4. I hope that the time has come when accouchement forcé is not recommended by any one, although the statement as quoted is probably too sweeping. Accouchement forcé has always been reserved for very exceptional cases by judicious practitioners because of the trauma inflicted to the parturient canal and to the nervous system of the woman, and because any practitioner possessed of knowledge and judgment can usually find safer though slower methods of effecting dilatation and delivery.

When the nervous system of the woman is in the state of eclampsia, forcible manual dilatation and delivery by forceps or by version will almost certainly increase the severity of existing convulsions and render threatened convulsions an actuality. If in threatened eclampsia accouchement forcé does not precipitate convulsions I would feel sure the danger of eclampsia was rather remote. How can a writer inform a student that the slight irritation of a vaginal examination may precipitate a convulsion and then gravely advise accouchement forcé?

5. Clinical experience and modern laboratory experiments speak with equal eloquence against the prolonged use of chloroform. As the conditions which precipitate convulsions usually continue for days and may continue for weeks, any therapeutic agent which cannot with safety be given over a prolonged period automatically eliminates itself from the position of a remedy of the first rank.

Pathological findings in fatal eclampsia show in most cases destructive changes in the liver. Animals made to breathe chloroform continuously for many hours, even in a percentage so small that sleep is not induced, are killed by the production of similar changes in the liver. If otherwise disposed to depend upon chloroform to control convulsions these facts should give one pause. But one is not compelled to look to physiological experiments for arguments against chloroform as a controller of convulsions. When tried for this purpose it so frequently fails that one is not tempted to risk the ultimate harm for an immediate benefit. Nevertheless, in the management of a toxemic patient chloroform has a field of usefulness. By obtunding sensibility during the second stage of labor it plays an important part in preventing convulsions.

Morphia.—If no better agent was available for the purpose morphine would be invaluable. If given fearlessly it will in a large percentage of cases control promptly the convulsions. It exerts no curative effect. Not only does it fail to increase elimination, but it locks up the secretions and interferes with excretions. In this way it tends to add to the toxic condition already present. The dangers from eclampsia are so frequently directly dependent upon the damage inflicted by the convulsive seizures, however, that in spite of the pernicious influence of the drug upon the eliminative organs its benefits may by far outweigh its evil influences. If so situated that a safer and more effective agent could not be secured I would not hesitate to give morphia and repeat it at intervals in sufficient dosage to keep the patient asleep until the acute storm had passed. Fortunately we have a better drug, one which will more promptly, with greater certainty, and more safely stop the convulsion and at the same time increase rather than retard the elimination of the toxic matters which cause the eclampsia. This drug (veratrum) has

been maligned by several classes of practitioners. Those with craven souls who dare not try agents possessed of positive therapeutic effects are not expected to try it. Those who follow blindly accepted authority will not use it unless they have learned with Goodell that "authorities are to be weighed and not numbered."

Those whose past writings show them familiar with the views of advocates of the drug—all of whom insist upon large doses pushed to full physiological effects—and then put up an empty pretense of scientific study, with controls, using doses of veratrum so small that no rational man could expect an effect, I am constitutionally incapable of judging.

Those who combine veratrum with its physiological antidote morphine need not seek far for an explanation of its inefficiency. To all such as these I have little hope of carrying conviction. With Sam Johnson I would say, "I give you my reasons, sir; it is not my province to supply understanding." But to the doctor who, actuated by the desire to rescue his patient from the dangers of one of the most appalling situations encountered in medicine, desires that guidance which the experience of others may supply, I will lay down a few simple rules which may aid him in acquiring an efficient therapeutic technique.

While increased blood-pressure is not always present in the preëclamptic period it usually is an early indication of trouble, and if this increased arterial tension can be overcome other manifestations of the condition may be warded off.

In the whole range of our materia medica no agent can be found possessing the properties of lessening blood-pressure so safely, certainly and harmlessly as veratrum! In the high blood-pressure of advanced renal disease, of arterial sclerosis, of angina pectoris, the experienced therapeutist can determine the blood-pressure which should be maintained, and can so regulate the dosage as to maintain it over a period of many months. Such patients, if of ordinary intelligence, will soon learn to judge by their own feelings the dose required, and the progress of many cases, where the result is inevitable, may be slowed down, life prolonged, and existence made more enjoyable, by the intelligent use of veratrum.

These effects are produced without the development of disagreeable symptoms. It is never necessary to produce nausea with the drug. Digestion is not disturbed and the symptoms of hepatic engorgement, which so frequently accompany these conditions, disappear, because even in moderate doses, 10 or 12 gtt. three times a day of Norwood's tincture by the mouth, an increased biliary output will be observed if one will watch the stools.

In acute toxemic conditions we do not have the steady, maintained rise of pressure which characterizes chronic conditions. The sudden high blood-pressure which precedes a convulsive seizure seems rather to be due to spasm of the end arteries, and a soft compressible pulse may within a few minutes become hard and bounding. If this condition is not headed off a convulsion occurs. Any convulsion may produce cerebral hemorrhage, or may be the starting-point of cerebral or pulmonary edema. These are the three ways in which death occurs in eclampsia. To ward off these dangers the action of your drug must be prompt, and prompt effects demand large dosage. Fortunately veratrum is a drug with a large factor of safety. If doubt exists whether the effect is adequate, it is always safe to give 15 minims more.

I have never known a physician who witnessed for the first time the production of a full physiological effect of the drug who was not alarmed and disposed to believe that murder was being committed, nor one who after two or three such experiences did not feel that the results produced justified the means employed.

Some practitioners, believing that the influence of veratrum is due solely to its lowering of the blood-pressure, do not employ it when the blood-pressure is not high. The dose is seldom as large with low blood-pressure, but the control of convulsions is just as positive. Its effect upon blood-pressure is not the sole reason for the control of convulsions. It acts just as posi-

tively and as promptly in strychnia convulsions as in puerperal eclampsia. I have had but two opportunities to test it in strychnia poisoning, but in each case there was not a twitch of a muscle after vomiting began. Occasionally the drug while controlling the convulsions does not control restlessness, and maniacal excitement following a convulsive seizure may last for hours. In such cases hyoscine will control the excitement without interfering with the action of the veratrum. Even its action upon the skin is not prevented. If the patient is quiet and will keep the blankets tucked well around her, free perspiration is always induced by a full therapeutic dose of the drug. The hot pack is not needed where veratrum is used freely. Reamy, years ago, insisted that morphia would within a few minutes cause the entire subsidence of the effects of veratrum.

He who gives both drugs has made no therapeutic test of veratrum. In the Cincinnati General Hospital patients are often brought in after being given morphine, and it requires a very free administration of veratrum to overcome this initial handicap.

The occurrence of severe hemiplegia may prevent the entire control of convulsions by veratrum, although it will always lessen their severity. I have several times, after the development of hemiplegia, seen mild convulsions continue after vomiting, sighing respiration and the slow compressible pulse had been produced. Even in these failures the convulsions are so modified as to be robbed of most of their menace to life.

In the rare cases of convulsions due to hyperthyroidism veratrum will modify the convulsions but may not entirely abolish them, mild convulsions continuing. In this type morphia given to narcosis is better. Dr. Reamy used to teach the superiority of morphia over veratrum in patients of a peculiar nervous type and described what would now be defined as hyperthyroidism. In the two cases seen by me veratrum lessened the frequency and severity of the convulsions, but morphine controlled them!

I have seen a number of cases of hyperthyroid patients with typical toxic convulsions which yielded to veratrum, and only two which did not yield, but they recovered under morphine.

What is the limit of the dose which may be given? The amount which it takes to produce the effects. I have given more than an ounce of Norwood's tincture in the first twelve hours by hypodermic injections, kept up the free administration for several days, and delivered a living child ten days later without the recurrence of convulsions.

By William D. Macon, M.D.,

Professor of Obstetrics in the University of Virginia, Charlottesville, Va.

1. Morphine; bleeding; medical rather than surgical treatment. Bring on labor with bougie, rubber bag—I do not favor accouchement forcé.

2. Delivery, if os is easily dilated or dilatable; morphine and accouchement forcé, if cervix is obliterated.

3. Morphine, croton oil, or Epsom salt; bleeding; sweating; enemata.

4. In my opinion, accouchement forcé as a method has been much abused, and is only advisable in very few cases.

5. Morphine in full dose is my preference for the control of convulsions. I do not use chloroform at all. Have no faith in veratrum viride, but have not used it frequently.

By W. Sinclair Bowen, M.D.,

Clinical Professor of Obstetrics, Georgetown University School of Medicine, Washington, D. C.

1. Under this heading I feel it will be wise to make subdivisions according to the degree of toxicity. Ordinarily speaking the patient is put to bed and elimination is encouraged through diaphoretics, hot baths, and diuresis. Cathartics are given moderately, care being exercised because of the danger of infecting the operative field with liquid feces.

If there is edema with hypertension, particularly in those cases in which the pulse

is full and strong, face flushed or cyanotic, venesection is done, this often being combined with hypodermoclysis. Morphine is used sparingly during this period.

2. I believe that the procedure varies, depending of course upon the patient. In multipara, after the first convulsion the patient may be put into a deep sleep and delivered at once. In other instances the patient has been given narcotics to stimulate, awaiting the natural termination of pregnancy in labor. Of course, between these two extremes medical treatment may be given and labor resorted to only as the patient's condition goes from bad to worse.

3. The treatment is almost entirely eliminative with sedatives, unless symptomatic.

4. No.

5. As regards the relative value of morphine, chloroform, and veratum viride in full doses as sedatives in eclampsia, let me say that I place a great deal of importance on morphine, but have not used either chloroform or veratrum viride for a number of years.

By P. Brooke Bland, M.D.,

Assistant Professor of Gynecology in the Jefferson Medical College of Philadelphia.

I beg leave to state that accouchement forcé is very seldom used to-day. I have never resorted to this manipulation.

I do not believe the recourse is justifiable. I have seen no reference to the topic in the literature of the past year, and I believe that the procedure will soon be entirely obsolete.

Very little space is given to the discussion of accouchement forcé in our modern text-books on obstetrics. The procedure should never be used in a primipara. In a multipara, with the cervix obliterated, it might be occasionally utilized. However, I should never use instrumental dilatation. This is barbarous. Gentle manual dilatation may be justifiable.

Violent delivery from below, as accouchement forcé implies, is associated with a high morbidity and mortality for both mother and child.

I approve the following direct replies to the questions asked:

1. Expectant, with free elimination. If no improvement, delivery by Cæsarean section, especially in primipara.

2. Immediate termination of labor either by forceps delivery, podalic version, or Cæsarean operation, depending upon the condition of the cervix. The first two procedures refer to multipara and the last to primipara. Venesection with saline infusion and free elimination must be used in all cases.

3. Venesection; saline infusion; morphine; free elimination.

4. Very rarely, if at all.

5. Chloroform should be used to combat convulsions. I believe in the free administration of morphine. This treatment is universally popular. I always use veratrum viride.

By John T. Altman, M.D.,

Professor of Obstetrics, Vanderbilt University, Nashville, Tennessee.

In reply to your request, I submit the following:

1. Absolute rest in bed—no company; cathartics, as calomel, salines, etc. Hot baths or packs (no diaphoretic medicines) for skin elimination. Water freely, and high colonic flushings for kidneys. Milk diet.

Watch patient closely. If symptoms improve wait and persist. If she fails to improve or gets worse in spite of active treatment, I would induce labor by Krause method. I do not wait until convulsions occur.

2. During labor: Morphia, ½ gr., at once. I rarely repeat it. It is my sheet-anchor to stop convulsions. I follow it with veratrum, bringing the pulse below 70. I rupture the membrane; put in bougie; pack lower segment, cervix, and vagina with gauze, or use rubber bags to aid dilatation. No anesthetic. If old primipara with canal intact, with little or no dilatation, and type severe, I would do Cæsarean section.

3. Postpartum eclampsia. If plethoric,

venesection followed by saline transfusion and morphia to stop convulsions. Free elimination.

4. I have long since abandoned accouchement forcé. I know of no recent writer that advises it. It should have no place in the treatment of eclampsia. If the case is sufficiently grave to demand immediate emptying of the uterus, Cæsarean section is far preferable.

5. Morphine is the remedy *par excellence* to stop the convulsions. Veratrum is a valuable agent to follow it. Chloroform has no field whatever in the treatment of eclampsia. I give no anesthetics except for operations; then I use gas and oxygen if possible to obtain, or ether when gas is not available. Chloroform is contraindicated at any stage. Anesthetics are useless to stop the convulsions; they should never be used except for some operative procedure. Gas first; ether second; chloroform never.

Surgery and Roentgenology[1]

BY CHARLES F. NASSAU, M.D., LL.D.

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Surgery has been practiced in some form since the existence of mankind. Progress in the art, however, has been marked by slow, painful advancement since its inception. For centuries growth was hampered by the sentiment against human dissection, and was stimulated and enlightened only by isolated discoveries of importance. Improvement has been rapid throughout the past century, and the art of surgery has been revolutionized by the discovery of antisepsis. Within recent years the use of the *x*-rays has added enormously to surgical attainment, both in widening the field and in accuracy of preoperative diagnosis.

The discovery of Wilhelm Konrad von Roentgen came to the assistance of surgery in 1895. *X*-rays were then, of course, in their crudest form. Since that time there has been a rapid and uninterrupted development in the science of roentgenology, until it has reached the point where it occupies an enormous field of its own.

Eliminating the fads that have appeared more or less periodically during the past twenty-five years, the present-day surgeon owes a debt of gratitude to Roentgen himself and to the men who have continued to work with *x*-rays since their discovery.

The rays were first of benefit to surgery in their application to fractures, for diagnosis of the break and for the study of the position of the bone after reduction. At the present time the surgeon would be handicapped without this aid. I admit it rather sadly, because I believe that this dependence has to some extent decreased his skill in the treatment of fractures. As an interne in a hospital in pre-*x*-ray days, I well remember the meticulous care that was used in fracture work by the older surgeons. From the time of the reduction until the patient left the hospital healed, the same daily attention was given by the chief himself. We had good results in fractures in those days, but I am sure we would have been surprised many times had we been able to see the anatomic alignment of some of the fractures that left the hospital with union, with at least fair contour and with good function.

The use of Roentgen rays in cranial fractures is of the utmost value. The surgeon who is attending a patient with a cranial injury, and who is unable to determine whether there is a break which should be trephined, is disadvantageously placed. Contrast with him the surgeon who has a report from the *x*-ray department which

[1]Read before the Roentgenological Society of Philadelphia, February 8, 1923.

states definitely that a large piece of the inner table is broken off. The first man is working in the dark, particularly if he be a so-called conservative in head injuries; the second man will proceed to trephine at once and relieve the patient of the pressure from the displaced inner table. In this way the development of late incurable complications may be avoided, while the first man's patient is not only exposed to such a risk, but he may even die of his initial injury.

Taking as I do a radical stand in the treatment of cranial injuries, I hope that some method will presently be devised by means of which small hemorrhages in the brain may be diagnosed with certainty. Such a discovery would be of inestimable value to both patient and surgeon, and when I consider the great strides that have been made in roentgenology up to the present time, it seems reasonable to believe that the rays will develop even greater value in the future. I am not unmindful of the recent discoveries in ventriculography, but I am not certain that it would be wise to subject a patient who is very ill as the result of cranial traumatism to the making of a ventriculogram.

In my opinion, the foundation upon which *x*-rays have their unassailable standing is in gastrointestinal, genitourinary and chest diseases. A considerable part of the surgery that is being done to-day is possible only because of the diagnoses made or confirmed by the skilful roentgenologist. I well remember what marvelous assistance I had in my first case of nephrolithiasis. The late Charles Lester Leonard confirmed the diagnosis and located the stone in the kidney. The absolute knowledge that the stone was in the kidney and not in the ureter was of incalculable satisfaction to me, and lessened the damage and danger to the patient. On another occasion Dr. Leonard saved me from operating upon a case of ureteral calculus in which the stone was so small that we hoped for its elimination without surgical interference. In this particular instance the stone was passed six months after Dr. Leonard's examination. Since that time there has been marked improvement in diagnosis of pathological conditions of the genito-urinary tract, particularly with the discovery of pyelography. To-day the surgeon who desires the best protection for his patient avails himself of the greater accuracy of a well-interpreted pyelogram.

It is in gastrointestinal work that the roentgenologist is without a peer. This statement is absolute and admits of neither discussion nor argument. The work of the roentgenologist is of more importance than that of the clinical laboratory to a patient who presents symptoms of a gastrointestinal disorder. Here, however, I want to voice a warning: a surgeon should never allow a diagnosis to be made for him, but should himself first make a careful clinical study of the patient.

It is only by thorough coöperation between the various departments of a hospital that the patient receives the greatest benefit. The baffled general practitioner refers the patient to the hospital surgeon with a note which states that the patient is suffering from "stomach trouble." The surgeon should make a careful examination in each case. The time when the patient should be referred to the roentgenologist has arrived only after the surgeon is unable to satisfy himself as to a diagnosis, or when he has a probable diagnosis in mind and desires confirmation. Sometimes when the *x*-ray study is finished and the report received, it is by no means conclusive. It is probably just as disappointing to the *x*-ray man when he reports a "possible gall-bladder pathology" as it is to the surgeon when he receives it.

Comparatively few operations are justifiable when based upon *x*-ray examination alone, and the surgeon should make his decision as to operation not only upon the report, but also upon the quality of work done by the man who makes the study. Occasionally we have a mistaken positive diagnosis of duodenal ulcer when the deformity is due to pericholecystic adhesions. A negative *x*-ray report in regard

to certain conditions would not influence me to withhold operation on a patient having marked clinical symptoms. For instance, I had in the ward of one hospital, not very long ago, a man on whom the *x*-ray report was negative. His clinical symptoms were pronounced, however, and at operation I found a huge duodenal ulcer. On the other hand, one of the most brilliant results that I have obtained for some time was in a patient who had had her appendix and gall-bladder removed, and who still, some months after operation, was troubled by frequent attacks of vomiting. A careful *x*-ray study showed that she had a spasm of the pylorus, and a Finney's pyloroplasty brought about the complete cure of her condition. Without the aid of the *x*-rays in this case I do not see just how it would have been possible for the surgeon to know what procedure to undertake. Certainly, if he had opened the abdomen and inspected the pylorus, he would have been no wiser.

In chest conditions, circumstances sometimes arise in which the surgeon would be unable to make an accurate diagnosis without the aid of the *x*-ray plate and its interpretation by the roentgenologist. It is in the interpretation of his plates that the roentgenologist shows particular skill. A perfect interpretation of the ordinary fracture plate can be made by any surgeon or any roentgenologist. It is in the diagnosis of inflammatory conditions that the highest skill is necessary in plate interpretation. I recall one patient who had an appendiceal abscess, later developed a subphrenic pus collection, and after that an abscess of the lung. I believe that this patient's recovery was due entirely to the accurate interpretation of the skiagrams that were made from time to time during the progress of his illness.

There is no doubt that the *x*-rays have rendered signal service to humanity in the retardation of malignant growths that have passed the possibility of surgical relief. I remember one patient who was kept alive, and in reasonable comfort, by this wonderful treatment for six years after a recurrence of cancer of the breast. The *x*-rays are of great importance in those cases in which the surgeon is unable to determine whether the patient is still in the period of operability. At the present time many surgeons who have the best interest of their patients at heart refuse to do radical breast amputations in cases upon which they would have operated without question five or six years ago. I must confess that I am extremely skeptical of the possibility of cure for a patient in whom the roentgenologist reports the presence of chest involvement. I am in favor of deep *x*-ray therapy in these cases, however, if by its use the patient's life can be prolonged.

My own observation in the treatment of tuberculous glands of the neck by the *x*-rays has not been very satisfactory. Possibly it is because some of the patients I have seen treated in this way already had softening of the glands before they began treatment. I believe that the majority of these patients ultimately reach the surgeon.

In the massive enlargement of lymphadenoma, a great reduction in size can be brought about by heavy doses of *x*-rays, but the result is a symptomatic rather than a real cure, inasmuch as fresh glandular growths take place internally, and the course of the disease is not fundamentally altered. The progress of leukemia may be surprisingly modified by *x*-ray treatment, but the change is without real cure of the underlying conditions.

I am hopeful that the recent discoveries in high voltage deep therapy may open up new sources of relief for patients who at the present time have no hope of recovery. I have a patient in Arizona who had a large endothelioma of the neck. By reason of its close attachment to the styloid process, I doubt whether its removal was complete. Following operation, the patient had two high voltage treatments, the first lasting for two and one-half hours and the second for forty-five minutes. He has remained well and without signs of recurrence for ten months.

I believe that the treatment of malignant disease by *x*-ray alone is in many instances an extremely doubtful factor in the recovery of a patient. If the roentgenologist treats a patient in whose case he alone has made the diagnosis and advised the treatment, I doubt if he is acting for the patient's best interest, even though he believes himself to be doing so at the time. A roentgenologist who treats unreferred cases of malignant disease should at least have the opinion of a surgeon before he confines himself solely to non-operative treatment. This should be done in order that the patient may have the utmost chance for recovery. The statement is made in Holy Writ that "man cannot live by bread alone." It is my belief that malignant disease cannot be cured by *x*-rays alone.

It is only by continued coöperation between the surgeon and the roentgenologist that we may more nearly hope to approach perfection. In many cases the surgeon is unable to do his best work for the recovery of his patient without the aid of the roentgenologist, and the good surgeon does not hesitate to call upon him. I believe that these two branches of medicine are interdependent to a great degree. There are circumstances, of course, under which either may work alone, but in the majority of cases the patient profits by their coöperation.

1710 Locust Street.

Keeping the Well Baby Well

BY JOHN D. DONNELLY, M.D.

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It has been computed that a new-born baby has less chance to live a week than a man of ninety years, and only the same chance to live a year as a man of seventy. About a quarter of all the babies that die during the first year die from indigestion and bowel disturbances, and several bottle-fed babies die to every breast-fed one. Many of these babies might have been saved had their mothers received proper prenatal care, and after birth, had they been placed under medical supervision while they were apparently well, and the physician's advice sought and followed on all questions of feeding and care.

We have our new automobiles inspected frequently; why not our new babies? Surely they are worth it! Unlike other machines, once a part of the human body shows excessive wear, it cannot be replaced by a new one; therefore it behooves us to keep the baby's body functioning in a healthy and fully efficient manner.

From birth the baby should be placed under the supervision of a physician who will give him a thorough physical examination at repeated intervals. Such examinations will bring to light unsuspected defects just in their beginning and before any damage or permanent change has taken place, as well as reveal mild but persistent changes in body functions. This permits proper treatment and correction before any real illness, impaired body function or marked deformity develops, and at a time when remedial measures are simplest, cheapest, and most effective. The long, useful and happy life of a baby is largely dependent upon his health in the first year. Weight in relation to length is the best single guide in estimating a baby's state of nutrition and development when considered with all other factors.

The most important period of life is that of growth and development. During this time the baby performs certain acts day after day until habits are formed. The secret underlying the formation of good

habits is *Regularity*. It should commence at birth. The baby should be nursed at regular intervals. Have him put to bed at an early hour and awoke each morning always at the same hour.

Every baby requires plenty of fresh air, as his metabolism demands a free supply of oxygen. Fresh air helps increase his resistance against colds and disease. The room in which he lives should be about 70° Fahrenheit, well ventilated and free from draughts. The windows of the room in which he sleeps should be opened from the bottom and his crib placed in a corner removed from the window. In winter, the baby should wear a cap and mitts and be placed in a sleeping bag. The crib can be protected by covering the sides with a blanket. When the temperature is approaching the freezing point, the windows may be raised just sufficient to keep a fair circulation of fresh air in the room.

Daily airings constitute a big factor in the health of babies. After the sixth week they may be taken out for a daily airing. The length of these airings depends upon the season of the year. In mild weather, at six weeks, an hour daily is sufficient, at six months at least several hours; from this time on, the more time a baby spends outdoors the better. In cold weather the outings must be shortened. When raining, the baby may be given his airing on a covered porch. Otherwise, have the mother dress him for outdoors, place him in his coach, and air him in a room with opened windows.

A baby exercises and plays naturally. Clothes, especially in the early months, are the chief source of restraint. His favorite methods are kicking and crying, a natural way for developing his muscles and chest. Several times a day when he is changed, have his mother lay him on a clean soft surface and let him kick and wave for several minutes. From the time the cord drops off the baby should be given a bath every day in his own clean tub. The baby will not catch cold from bathing unless he is chilled, and there is no reason for this if the room be warm and the time consumed short. As the baby grows older the bath should be made less warm until tepid. The daily bath is a good habit. It makes for health and strength. When the weather is warm, a cool sponge twice a day is refreshing.

Sleep as a habit is very important. See that the mother trains the baby to fall asleep of his own accord after nursing without a nipple in his mouth, and not with a light in the room, nor with some one rocking him. Turning night into day is a bad habit, and helps undermine good health. The baby sleeping in his own bed, in night clothing, with fresh air, protected from flies and mosquitoes, and at regular hours, means the right kind of rest for growth and vigor. After two months a baby begins to sleep less. By the sixth month he should sleep from 16 to 18 hours a day. After the fifth month, if possible, omit the midnight bottle.

The growth and development of the nervous system should be amid peaceful and quiet surroundings. Quiet and uninterrupted sleep are necessary. Undue excitement following the "showing off" of the baby and his tricks to admiring friends in the evening, or the bedtime romp when the baby becomes "wild," is very harmful; it tends to disturb the development of a stable nervous system, and it is no wonder that such babies become "nervous," sleep poorly, cry much, have poor digestion, and are underweight. The baby needs lots of "intelligent letting alone," otherwise a foundation may be laid in infancy for nervous derangements which may develop later. Babies should be trained to choose certain lines of action for themselves, and to devise ways of amusing themselves. The constant providing of new toys teaches discontent and lack of appreciation.

The baby should be dressed comfortably in loose-fitting garments, allowing plenty of room for exercise. All he needs is a belly-band, shirt, diaper, petticoat, and simple dress. The belly-band should be discarded after the second month and a knit-

ted band with shoulder straps substituted. Dresses should not have lace or starched collars, as they may irritate the neck. When the weather becomes cold additional outer garments should be put on upon going outdoors. In overheated homes, babies who are overdressed perspire, have open pores, and do not react properly to the colder temperatures when taken out. Too much clothing and overheated homes are a common cause of colds among infants and children. In the hot summer months all the baby needs is a band and diaper.

No two babies develop exactly alike; nevertheless, it is necessary to have a common standard with which to compare any given baby. The normal, healthy baby is bright-eyed, alert, happy, and sleeps peacefully. His appetite is good, he gains in weight, and does not vomit or spit up except when overfed or after being moved about too suddenly after nursing. The average baby at birth weighs 7 or 7½ pounds. This weight is doubled in five to six months and trebled in a year. At birth he is 19 inches in length, gains about 5 inches in the first five months, and measures 27 to 28 inches in length when one year old. By the fifth month he should be able to hold his head erect and notice his hands and laugh aloud. Between the fifth and seventh months teething usually begins—the baby likes attention, reaches for toys and can hold them, puts things in his mouth, knows his mother. By the ninth month he should be able to sit up, unsupported. In the tenth month he may begin to creep. He should be able to pull himself up and stand with help when one year old, and say a few simple words like "mamma." The average well baby walks by the fifteenth month. Walking is a mental as well as physical process. If it is delayed beyond the eighteenth month, the cause should be sought. The fontanel should be closed between the eighteenth and twenty-sixth month. A bulging fontanel demands observation and study.

The baby's arms and legs grow in proportion to his body. The chest should broaden and round itself symmetrically, free of grooves and depressions. Discharges from the umbilicus or umbilical hernia demand attention.

As a rule, well babies have solid flesh and firm muscles. Flabby babies are never strong babies; illness goes hard with them. For the first six months babies usually make an average gain of about six ounces weekly; between the sixth and twelfth month the average weekly gain is about four ounces.

The new-born baby needs no cathartic. When necessary, he may be given a teaspoonful of mineral oil at the end of twenty-four hours, followed by a saline enema (2 ounces) twelve hours later. A baby should have at least one good bowel movement a day; this habit once formed and encouraged should persist throughout life. The stools of well breast-fed infants are usually light yellow, pasty or mush-like, averaging one to three daily. Bottle-fed babies should have an average of one to two soft, smooth and well-digested salve-like stools each day. The well baby rarely needs a cathartic. When necessary, milk of magnesia in teaspoonful doses is the one of choice. Ordinarily the food can be changed so as to bring about voluntary bowel movements. Excessive mucus or curds in the stools are earliest signs of oncoming digestive disturbances.

Constipation interferes with health and nutrition. Among breast-fed babies it is sometimes associated with constipation in the mother. In the bottle-fed the more common causes are too high percentage of fat, insufficient quantity or too weak a mixture, boiled milk, and sometimes lack of muscular tone of the intestines. Examine rectum of all constipated babies. The cause should be sought and corrected. After the sixth month, stewed fruit juices help in aiding regular bowel movements. Orange juice is *not* a laxative. Massage several hours after feeding helps at all ages. With tips of fingers gently stroke up abdomen along right side, then across and down on left, followed by a general

light kneading of the whole abdomen. Mineral oil in teaspoonful doses may be given once or several times a day.

Nature has provided *one* powerful weapon for combating infant deaths, namely, breast milk. The food necessary to supply everything that is needed for the baby's growth and development is best created for it in the breast of its mother. It is the natural food of babies—the *only* one made just for them. Special immune bodies in breast milk protect babies against certain contagious diseases. When every mother knows how perilous is the first year of life and the greater protection afforded her baby by breast milk, fewer babies will be weaned unnecessarily, hence there will be fewer infant deaths.

Occasionally, articles in a mother's diet, usually proteins, will affect milk, and so in turn may cause eczema in the baby, the result of sensitization. If this occurs cut out eggs and cereals for a week, and then add one at a time to the mother's diet and notice effect on child. If no results be obtained, cut out meats, then vegetables, and replace them one at a time at intervals of several days.

When a mother has an insufficient supply of milk, give the baby a bottle *after* each nursing to make up deficit in quantity of breast milk, and try the following method: Have the baby completely empty the breast at each nursing. If the baby fails to do this, have the mother scrub her hands with soap and warm water. Then grasp the breast gently but firmly with the thumb in front and forefinger on under surface of breast just back of the areola or pigmented area. With a motion "back, down, and out" eject from the breast any remaining milk into a clean, freshly boiled glass and give it to the baby. Improve the mother's general health by plenty of fresh air, daily bathing, outdoor exercise, sufficient rest, and daily bowel movements. Three full meals a day, hot chocolate with one meal, three glasses of milk and several glasses of water daily. Have her avoid late hours, worry, and nervous excitement, and nurse her baby regularly at intervals of three or four hours.

Well babies do best on a three- or four-hour feeding schedule, five or six feedings in the twenty-four hours. All bottle-feeding should be under the direct supervision of a physician, and cow's milk the substitute of choice. A baby's digestion is often upset and seriously impaired by starting him off on cow's milk diluted only one-half or two-thirds. It is better to start a baby, say three months old, on one part cow's milk and three parts boiled water, the whole boiled slowly for one minute, being stirred all the time. In the course of five to seven days this can be gradually raised and milk sugar or dextrimaltose added until the mixture is one-third milk with a sugar content of approximately 5.5 per cent (3 level tablespoons of dextrimaltose added to each 20 ounces of mixture). If the milk supply be safe, boiling of mixture may be stopped after first week. When in doubt, continue boiling the mixture. All babies should get orange juice daily, beginning with two teaspoonfuls, diluted half and half with boiled water in the second month and increased to the juice of a whole orange by the fifth month. When boiled milk or canned milk is used, orange juice must be given to prevent scurvy.

At times it is inadvisable to use cow's milk, due to the difficulty in preserving it. In such instances it is better to use condensed milk or one of the dried milks, such as "klim." Klim approaches whole milk in composition when one part of klim is added to six parts of boiled water, giving the approximate amounts of fat, sugar, and protein, as is in whole cow's milk. It can then be diluted the same as ordinary milk for whatever formula desired.

Calcium salts are required for the formation of dental and osseous tissues. Mother's milk contains calcium in sufficient amount to satisfy the baby's requirements. Cow's milk contains several times more calcium than does mother's milk. A baby need not be nursed after the ninth month,

unless it be to avoid weaning during the summer months.

It is well to vaccinate babies before the end of the first year. We now have means of determining susceptibility to diphtheria (Schick test) and of immunizing against it with the toxin-antitoxin mixture. Three months are required for the complete development of immunization. If a baby be exposed to diphtheria within this period, he should receive an immunizing dose of diptheria antitoxin.

SUMMARY.

1. After giving a baby a thorough physical examination, the physician can point out to the mother any defects present or developing and convince her of the value of early correction.

2. Under the physician's supervision the baby's food and general hygiene can be regulated so as to provide the necessary advantages for normal growth and development.

3. Parents are quick to realize the value of a thorough physical examination.

4. Babies can be vaccinated against smallpox before the ninth month.

5. All babies, irrespective of age, who are susceptible to diphtheria, should be immunized with T-A mixture.

6. Parents appreciate the services of a physician who is desirous of keeping their well baby well.

The Spirit of Louis Pasteur[1]

BY HOBART AMORY HARE, M.D.

Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia

To respond to a toast to Pasteur after nine other speakers, not including the toastmaster, have dealt with the same subject in the brief space of a few hours would be impossible were it not that what has already been said serves to indicate that the theme is inexhaustible.

In dealing with the subject of Pasteur in medicine it is all but impossible to avoid repeating some of the points already so well emphasized, yet I am bold enough to believe that certain additional facts may be brought forward if the toast reads "Pasteur and Medicine." The first point deals of course with the work which Pasteur did to make medicine more of a science and less empirical; to reveal to us that infectious disease never arises *de novo*, but always from another living organism which has been invaded by a given parasite. By this discovery the whole field of preventive medicine has ceased to be a desert and becomes a plain fertile beyond description in its result to the human race, for after all for every life that is saved by treatment after disease is implanted, thousands of lives are saved not only from death but from weeks of misery which may only perchance end in recovery. When we recall the fact that the mortality from typhoid fever was at one time 20 per cent and that now its incidence and mortality is almost negligible, and further when we recall that the mortality from this disease in Berlin was at one time one in every 900 persons whereas now it is about one in 11,000 persons, the amount of suffering and death which has been prevented from this one disease is stupendous.

The researches of Pasteur, as Doctor McMurtry has told you, have saved thousands of lives in surgery, and have also saved millions of lives for medicine, for, as I have pointed out, medicine deals not alone with those who are ill, but with those who may become ill, and in India it not infrequently happens that as many persons die in one year from plague as the entire popu-

[1] Being one of several addresses delivered at a banquet to celebrate the centenary of the birth of Louis Pasteur.

lation of the city of Philadelphia as it exists to-day, all of which could be prevented if the fundamental principles laid down by Pasteur could be instituted. Not only this, but Pasteur showed that experiments on animals serve, by increasing knowledge, to protect millions of human beings and millions of other animals from suffering and death.

It is needless to deal with those other scourges of humanity, notably diphtheria and tuberculosis. They show almost equal results. Those of us who had to cope with typhoid fever and diphtheria some years ago know full well how impotent we were and with what agony of mind we saw our best efforts fail when epidemics occurred. Now we can prevent and cure.

This theme has been so well covered by earlier speakers that it is not appropriate to dwell upon it longer. It suffices to state once more that Pasteur laid a foundation for the healing art which will last forever.

But after all, the phase of Pasteur's efforts that I have just passed over is not the only point of importance for us to consider, for Pasteur and his relation to medicine has another aspect. Let me for a moment recall to your mind that from youth to old age he loved truth for truth's sake, that he loved science for its sake, that his pulses throbbed at the first sign that a research was pregnant with truth and discovery, and that he rejoiced not that he had found a way to make a fortune for himself, but a fortune for Knowledge. Mozart and Beethoven never thrilled more with their own music than did the soul of Pasteur as each investigation neared its end, not that he saw and grasped for himself the financial reward of his labor, but because his reward came in the satisfaction of the discovery itself.

Again, if we review the personal life of Pasteur we note his humble origin, his early poverty, and for many years his constant poverty, his bereavements, and equally distressing his stroke of paralysis in middle life, from which he thought never to recover, and which threatened death when he was in the full tide of his career. Yet he lived twenty-seven more years, becoming greater every decade. For these reasons, more than his actual discoveries, is his memory to be revered, because he taught us as few others have succeeded in teaching so well, that faithfulness to a great ideal, that victory over every object, must be the goal of every man, if he is to be worth while. The result to-day is that where there was one scientific investigator in the field of medicine in the latter part of the last century, there are to-day several thousand, all imbued at least with what may be called "the soul of research;" lantern bearers, some of whom fall by the wayside, if they do not truly find this soul; others bearing lanterns glowing with incandescence as they spread more and more widely over the world, lighting darkest Africa on the one hand or lighting darkest civilization on the other. This then is the divine gift handed by the Almighty through the person of Pasteur to the world to-day and to medicine in particular. He gave those investigators who would take it a soul, or what the Samurai among the Japanese called "Bushido." What is this soul? It is something intangible but real, something of which we are conscious, but cannot feel. It is that thing that Osler in his Ingersoll lecture on Immortality said was the inspiration of the Teresians in distinction from the distraught state of the Laodiceans and Gallionians. It was well described by Giles Fletcher.

But it is not proper to think that Pasteur was the only man who gave us a chance to grasp the soul of research. Here in our own midst there lived another whose career ran strangely side by side with that of Pasteur, namely, Joseph Leidy. Pasteur was born December 27, 1822, the son of a small tanner; Leidy was born September 9, 1823, the son of a small hatter. Both lived almost the same span in years; both were alike as to their physiognomy and spacious brain cap; both were alike as to their greatness and their power; both struggled with a poverty of cash and both reached the richness of achievement; both taught rudimentary things in order to keep the wolf

from the door; and both were elected to professorships early and at about the same age. While Pasteur was interested in chemistry and crystallography, Leidy was interested in mineralogy and precious stones; when Pasteur was studying the microscopic parasites of animals and men, Leidy was becoming the greatest living authority on the macroscopic parasites, and benefited humanity by his discovery of the *Trichina spiralis* and by observation that the *Necator americanus* was the cause of severe anemia. Pasteur has had an enduring monument erected to him in Paris, and Leidy has had a peak in the Rocky Mountains named "Mount Leidy" as a tribute to his work as geologist and paleontologist.

But while Pasteur and Leidy gave us the soul of reasearch, beyond this their paths separated, for Pasteur's studies enriched science, medicine, and commerce, and Leidy's only enriched science itself. And again they differed in one other respect, namely, that Pasteur possessed not only the characteristics of the steadfast investigator but imagination as well, a quality which Leidy largely lacked, and imagination, if properly controlled, often leads one forward by leaps and bounds to a sure achievement; imagination uncurbed is fatal, but controlled it almost divine. Uncurbed it is embodied in Henry Ford and his Peace Ship, filled with angels of peace propelled by gasoline, and when curbed is shown by Turner in his paintings.

What then are the gifts that Louis Pasteur left to us? First, there is no such thing as spontaneous generation, which being interpreted means we can always find a cause for disease in plant life, animal life, and human life, if we know how to look for it.

Second, constancy in adhering, in and out of season, to the course laid down, combined with sound judgment exercised when the course should be changed but not arrested.

Third, he gave thousands of men a motif or a soul, in that he inspired them to seek and find and conquer all obstacles.

Fourth, he taught us that as we love science so will it love us, and that in this love there comes a peace that passes the ordinary man's understanding.

Last, but not least, he left the precious heritage that to be truly brave is to have courage when courage seems impossible, or, to use the phrase of a recent French writer discussing the World War, the English were not brave on the battle-field because they were courageous, but because bravery with them was a habit. Courage on the battle-field, great though it be, is not so great as the persistent courage in the lonely hamlet or in the isolated laboratory in the face of pestilence.

Pasteur showed as "invincible a spirit, as sublime a courage, as unwavering a faith, and as knightly an example of self-sacrifice as the annals of the human race can disclose."[1]

Convalescent Serum as a Prophylaxis in Measles and Chicken-pox.

BLACKFAN, PETERSON, and CONROY, in the *Ohio State Medical Journal* for February, 1923, state that the serum of patients convalescing from measles or chicken-pox confers an efficient temporary immunity when injected into susceptible individuals within five days after exposure.

The use of these sera, when unsuccessful in establishing a complete immunity, does afford sufficient protection to limit the disease to a mild form.

These sera afford a very efficient means of preventing severe epidemics in hospitals and institutions.

They afford a valuable protection to those children exposed to measles or chicken-pox in whom the natural resistance has been lowered by other existing infections, and it is recommended that this protection be afforded all children exposed, not only those who are convalescing from acute diseases, but those who are suffering from nutritional disturbances, tuberculosis, and other chronic diseases.

[1] These words in quotation marks are taken from the Houston, Texas, *Post*, which journal applied them to the British nation.

Editorial

ANIMAL FOOD AND HIGH BLOOD-PRESSURE.

We presume that one of the most universally accepted propositions on the part of the medical profession has been that renal disease and high blood-pressure contraindicate all, or nearly all, albuminous food in the shape of meat, with peculiar emphasis laid upon the objectionable character of red meat. The theory has also been widely held that high blood-pressure and chronic renal disease are closely related conditions, and while this is undoubtedly true, it is becoming increasingly evident that high blood-pressure may exist without renal lesions and that renal lesions may exist without inducing high pressure. So, too, as we have pointed out in earlier editorial notes or in the original columns of the GAZETTE, the idea that red meats are more deleterious than white meats has long since been exploded. Again in certain cases of parenchymatous nephritis with a very profuse loss of albumin in the urine, it is a grave question as to whether albuminous food in moderate amount is not desirable to compensate for such loss.

Furthermore, it is undoubtedly a fact that many cases of chronic renal disease of either the parenchymatous or the contracted type, with or without high blood-pressure, when placed upon a protein-free diet lose strength and vigor quite rapidly, with a restoration of at least some of this vigor when one who is not so hidebound in adhering to a protein-free diet takes charge and permits a moderate amount of animal food to be ingested.

We recognize that these statements are in conflict with widely held opinions, but we believe that they are in accord with the views of most of those who have devoted particular attention to this subject.

One of the most recent contributions to this important topic has recently been published by Strouse and Kellman, who endeavored to determine the effect of protein feeding upon blood-pressure. After quoting the very large amount of literature on this subject and to a very considerable extent, and thereby showing that they are fairly familiar with it, they proceed to report the cases in which they have carried out their studies and reach conclusions which are of very considerable interest. In the first place they found that in cases of high blood-pressure no damage to renal function and no increase in non-protein nitrogen or urea nitrogen in the blood was found to follow protein feeding which did not exceed 150 grammes per day. Not only was this conclusion arrived at, but in three cases of high blood-pressure even the use of strong stock soup, which, of course, is supposed to be laden with purin bodies, and the administration of coffee daily did not increase blood-pressure.

Furthermore, when definite progressive degenerative nephritis associated with hypertension was present, a diminution of intake in animal food sufficient to lower the amount of non-protein nitrogen and urea in the blood did not result in lowering the blood-pressure.

We think that our readers will be interested in these seemingly competent experiments, recognizing too, as we have frequently pointed out, that a blood-pressure which is abnormally high as compared to what is considered standard, and in that sense pathological, is nevertheless essential in many cases in order that an adequate circulation may be maintained.

Strouse and Kellman apparently believe that the variations in blood-pressure which have been noted by those under a protein diet or under its deprivation, have been in reality due to the natural variations in blood-pressure which take place from hour to hour and day to day in every individual to meet the needs of existence as to external and internal things.

THE RELATION OF ALCOHOL TO INSANITY.

It is a very wide-spread belief among all classes of persons sufficiently intelligent to be interested in this question that the use of alcohol is an etiological factor in the production of insanity, and this view has been reënforced by statements made in text-books dealing with diseases of the mind and by statistics which have been provided by asylums for the insane. In the case of the text-books it is probable that the opinion is transmitted from one author to another or is based upon asylum statistics, but it is becoming increasingly evident, if not positively proved to be a fact, that asylum statistics are largely in error, being based upon the fact that the patient gives a history of having used alcohol to excess, which may or may not be true, or that his friends may make such statements concerning him, or again it has been supposed that where there was an alcoholic history it was justifiable to consider it as the etiological factor in the case, when, as a matter of fact, a primary mental instability is rather the cause of the alcoholism than the result of it.

In discussing this question it is of vital importance that the medical profession should occupy a position of scientific accuracy whatever the opinion of individual members of it may be as to the use of alcohol as a beverage or as a drug. It is essential that correct conclusions shall be drawn not only because right is right, but also because if they are not correctly drawn, in the end, they serve only to weaken the evidence which may be brought for or against the use of this drug. In other words, the truth will ultimately prevail although the finding of truth may be long delayed, and when it is found, those who have by intent or inadvertence perverted it, will be in the vocative.

An interesting and important editorial upon this subject has recently appeared in the London *Lancet,* in which it is pointed out that no less an authority than Sir Frederick Mott has drawn attention to some of the facts which we have enumerated, and also to the results in large English insane asylums, which show that the diseased conditions peculiar to chronic alcoholism are relatively rarely met with at post-mortem examinations of the insane, and when found existed in the bodies of those suffering from a definite alcoholic psychosis, which form a relatively small group of cases of insanity in large institutions.

Other investigations are quoted which show that in those parts of England, and elsewhere, where alcoholism is comparatively speaking rare or unknown, insanity is not diminished in frequency, but is just as frequent if not more so than where the abuse of alcohol as a beverage is resorted to.

The same editorial also shows that although there has been a very remarkable diminution in the convictions for drunkenness during the last few years in England, by reason of restrictive laws as to the constant sale of spirits, nevertheless the admission of women to asylums in England and Wales has shown no decline, but a slight increase, and the same facts hold true in regard to the male population, except that the statistics suffer in accuracy because of the fact that between 1913 and 1918 so great a number of men were drawn from civilian to military life.

These facts have been again supported, as the *Lancet* shows, by Peretti, because, writing in Düsseldorf, he shows a decrease in alcoholic patients amounting to 87 per cent in the case of males and 78 per cent in the case of females, largely because the absence of various grains necessitated restriction in brewing and distillation. This great diminution in alcoholism, however, was not associated with any corresponding decrease in the frequency of ordinary forms of insanity.

Similar conclusions have been reached by Bonhoeffer of Berlin and Schneider of Cologne, as well as Wagner-Jeuregg in Austria.

In other words, to quote the *Lancet* once

more, the enormous experiment which has been inadvertently made during the war shows pretty conclusively that the only insanity produced by alcohol is alcoholic insanity, and that in general terms it is not an active etiological factor in producing other forms of mental aberration.

These facts in no way militate against the argument that the abuse of alcohol is to be condemned, because when taken in excess and particularly if so used over a long period of time, it undoubtedly impairs moral tone as well as the function of vital organs. It is also to be recalled that the vast majority of those who in the past have been accustomed to use alcoholic beverages have used them in moderation and not in excess.

As we have already pointed out in many instances of insanity with an alcoholic history, fundamental mental weakness is the cause of the abuse of alcohol, and again it is also true that one whose mind is on the verge of insanity and kept in leash by a narrow margin may have his inhibition when under the influence of the drug sufficiently removed to be guilty of irresponsible acts, just as he or she will break mentally when subjected to some nervous stress and strain in domestic affairs, or in business, whereas if these conditions had not arisen mental perversion would not have occurred or been recognized.

THE VALUE OF MERCURY INHALATIONS IN THE TREATMENT OF SYPHILIS.

Within the last year some of our readers will recall that the results of an investigation published upon this subject would seem to indicate that this method of treating syphilis should be put into the discard for a number of reasons, these being chiefly that the amount of mercury actually absorbed into the system was relatively small, that its quantity could not be determined, and, therefore, the activity of the treatment could not be accurately gauged, and finally that its tendency to produce stomatitis very early in the treatment often prevented the use of mercury by other means, and thus deprived the patient of a valuable agent in combating his infection.

It is interesting to note how opinions may differ in regard to matters of this kind. Thus, in the issue of the *American Journal of Syphilis* just received, Gutman contributes quite an exhaustive paper upon this subject, and after pointing out the great popularity of the inhalation therapy in the middle ages, discusses some of the more recent literature in support of it. He seems to show that the paper which we have just discussed is wrong in its decisions, stating that the literary evidence setting forth the extensive and beneficial use of mercury vapor is much too exhaustive to treat in detail. He quotes Fournier to the effect that a series of observations have proved that fumigations have cured syphilis of different kinds more or less rapidly, particularly in secondary conditions, such as vegetating mucous patches and ulcer lesions of the skin. American authors, such as Bumstead, are also quoted, as are authorities in Vienna and London.

Gutman asserts that whenever mercurial vapors have been administered in sufficient quantities, they have never lacked action and have always produced some definite effect, although he admits that the results may have been desirable or undesirable; that undesirable results occurred most frequently when other substances were added to the mercurial compounds, with the erroneous idea that they would increase their efficiency. He states that much of the after-effects which have been reported have been due to this cause or to the fact that the method of administering the vapors, to say the least, was crude and unscientific. For this reason, Gutman expresses the opinion that while in the past history of mercury vapor therapy there is much that is undesirable, there is much more which commends it and places it, to use his words, among our well-recognized and lauded therapeutic procedures in medicine.

Not content with this literary and clinical review of the subject, Gutman also reports in the same journal his investigations upon the effect of mercury inhalations upon the animal organism; that is to say, studying the gross and microscopic pathological changes in the organs of animals subjected to inhalations of mercurial vapors. Comparing them with the conditions found after the use of mercury by the mouth, hypodermic injection, and inunction, he found that under similar circumstances the pathological changes following such administration of mercury are approximately identical whatever the route attempted may be. In each instance toxic changes consisting in marked congestion of many organs and severe destructive processes affecting the intestinal tract and kidneys, with lesser damage to the liver, spleen, adrenals, and nervous system. The excessive use of inhalations of concentrated vapors also damages the lungs, but diluted vapors in which the doses are not too strong are not productive of harmful effects in these organs.

It would seem, therefore, that in certain types of syphilitic invasion treatment by sublimation of calomel, or other mercurial, and its ingestion by inhalation, should not be entirely cast aside.

LIMITATIONS AS TO COCAINE.

Some of our readers may be cognizant of the fact that a campaign is being waged to exclude the manufacture or importation of cocaine into the United States on the ground that it is a habit-forming drug and that other local anesthetics which are not prone to produce a habit are qualified to take its place in medical practice.

We believe that this campaign is not quite as altruistic in its motives as it would appear at first sight, and we are also firmly convinced that a large number of practitioners, particularly those who deal with diseases of the throat and nose, are firmly convinced that cocaine provides a factor which none of the synthetic local anesthetics are able to manifest, chiefly in connection with the fact that it produces a primary ischemia of the tissues when it is applied to them, and thereby opens up respiratory passages which otherwise could not be so readily investigated.

If we go upon the supposition that the campaign referred to is purely altruistic in its purpose, we come face to face with the question as to whether a relatively small proportion of human beings with unstable nervous systems and perverted tendencies are to be protected against the illegal use of a drug while a multitude of respectable and normal citizens are to be deprived of its beneficent effects.

Our readers will recall the fact that a similar campaign was started several years ago which was intended to wipe out the existence of heroin. Here again we had an illustration of an endeavor to protect a few and in so doing to penalize a far greater number of normal citizens.

While it cannot be denied that many of the newer local anesthetics often can be used, and are used, as very proper substitutes for cocaine, we think that our readers will agree with us that physicians need every aid which they can possibly obtain to meet the various manifestations of disease which come to them from time to time. So far as we know it is not denied by any of the enthusiasts supporting such campaigns that these drugs are capable of doing great good. In their anxiety to help a certain type of frail human being they are led by their enthusiasm to entirely ignore normal individuals, and we believe that the legal measures which are now in existence, if properly enforced, are competent to control the illegal use of these drugs to as great an extent as it is possible to control the use of anything.

The chief points which we wish to emphasize we have already mentioned, but we reiterate in order that there may be no misunderstanding in regard to our position in the matter; this point is, that a physician should not be hampered by legislation when it comes to a question of what is the best thing to use for the benefit of a human being who needs assistance.

THE THERAPEUTIC USE OF THE BACILLUS ACIDOPHILUS.

Our readers will remember that not long since we called their attention to certain investigations which indicated that the bacillus acidophilus was proving to be of distinct value in cases manifesting putrefactive changes in the intestinal contents; correspondingly that it was contraindicated where there was fermentation in the intestines due to inability of the patient to deal with carbohydrate foods. Attention was also called to the fact that recent researches seemed to indicate that it remained viable after reaching the colon, whereas the bacillus bulgaricus seems to have much less ability to maintain its existence in this region. Still further researches now seem to indicate that it is a very definite remedy for certain types of constipation, and have confirmed opinions previously expressed that it remains in active growth in the colon if it is taken in the best form for its administration, namely, in bacillus acidophilus milk.

Thus Kopeloff has shown that whereas sterile milk does not relieve constipation, the proper growth of the bacillus acidophilus in milk greatly benefits many cases of intestinal torpor not only while it is being ingested, but also for a number of months afterwards.

The great difficulty at the present time seems to be to find upon the market preparations which are in themselves active, as an examination of many of them seems to indicate that in their preparation the vitality and reproductive power of the bacillus is greatly diminished. It is also apparent that liquid preparations of this microörganism are more likely to be efficacious than when it is prepared in tablet form. Recognizing that conditions unfavorable to the microörganism materially impair its usefulness, at least one manufacturer now places upon the market bacillus acidophilus milk and ships it from the laboratory to the consumer every 24 hours, thereby assuring the patient of the full therapeutic value of the preparation.

THE SURGICAL TREATMENT OF INFECTIONS OF THE PERITONEUM.

That time is well within the memory of leaders of thought and practice when the peritoneum was regarded as the most vulnerable and least self-protective tissue of the body, endowed with no power of defense and able to pursue its function only under most favorable circumstances. Contamination with pus was regarded as almost invariably fatal, and means were employed to remove this contamination when it occurred; means so violent that the delicate membrane with its enormous defensive and reparative powers was so vulnerated that it was no longer able to put up that defense against general infection upon which, in its normal condition, complete dependence may be placed.

In this relation Fraser (*Bristol Medico-Chirurgical Journal*, January, 1923) reverts to the time when, for instance, after an appendix operation, with pus or exudate not walled off, following the removal of the appendix, the entire peritoneal cavity was irrigated, or at the hands of some surgeon the intestines were turned out and washed or wiped, this being followed by the insertion of multiple large drainage tubes. Thereafter the unfortunate victim, during the continuance of his short and agonized life, was deprived of water, given powerful doses of concentrated purgatives, and not even allowed the consolation of an anodyne.

Dudgeon and Sargent compare the endothelial lining of the abdomen and its contents to the skin of the hands; the latter may be bathed or gently rubbed with most virulent infection and without danger, provided the skin is intact. Given a break in the surface infection will occur. The same is true in the peritoneum.

Fraser notes that the presence of pathogenic bacteria in the peritoneal cavity causes a large serous effusion containing many phagocytic cells which greedily seize upon the bacteria and are usually found in the subdiaphragmatic endothelial lymph

spaces. There also forms over the intestinal surfaces a layer of fibrin, often so thick as to be visible and palpable, but universal, and in many places to be detected only with a microscope. This fibrin is a defensive armor meant to protect the endothelium, also an agglutinative substance by which intestinal coils limit the spread of inflammation. It is obvious irrigation washes away one of nature's means of cure, and the traumatism of an efficient and complete irrigation breaks the continuity of the epithelial surfaces. Even in perforating gastric and duodenal ulcer Fraser holds that lavage is unnecessary. Indeed, these views so generally obtain that irrigation is the exception rather than the rule. Bearing on drainage, the rapidity with which a tube introduced is walled off militates against the effectiveness of this procedure.

Fraser believes its use should be the exception rather than the rule. The feeling of the day is that all that is needful for the peritoneum to exhibit its full defensive powers is that the grosser sources of sepsis be removed. In abdominal wounds it is not the peritoneum but the extra-peritoneal tissues which require drainage. The infection of these tissues was the usual cause of death following operation in the World War. From which it follows that in the presence of sepsis the abdominal wall should always be drained down to the peritoneum, and the peritoneal cavity should be closed and should not be drained. The exceptions to this rule are laid down by Fraser as follows:

"When there is free oozing at the site of operation which cannot be completely stopped. As a collection of blood-clot is obviously undesirable in the presence of infection a drain should be left in for twenty-four to thirty-six hours.

"When it is expected that a viscus may discharge its contents at the site of operation; *e.g.*, the ligature may cut through the softened cystic duct after removing a gangrenous gall-bladder, and bile may be discharged. A drain at the point of expected leakage is an obvious safeguard.

"When there is present in the peritoneal cavity a localized abscess-cavity with organized walls which must discharge piecemeal over a period of time, a drain must be left in. This is not strictly drainage of the peritoneum, but of an abscess-cavity which is really extra-peritoneal.

"When on account of the patient's condition or for any other reason the primary focus of infection is not removed a drain must be inserted in its neighborhood."

Bearing on the use of morphine for abdominal operations, Fraser states:

"For many years every patient after abdominal operation in my practice has had sufficient morphine to keep him in reasonable comfort when he needed it, and every case of peritonitis has had morphine as a routine for the first two or three days as part of his treatment, and whether he required it for pain or not.

"While an ordinary incidence of flatulent distention occurs, easily relieved by flatus tube or by enema and pituitrin, the severe forms of paralytic ileus are practically unknown; no case of ileus duplex has been seen.

"In my earlier experience severe paralytic ileus was more common, before I habitually used morphine and while aperients were yet being given. Aperients, such as calomel, given while the bowels are inflamed actually tend to bring on the worst forms of intestinal distention, with the object of preventing which they were administered.

"It will be noticed that pituitrin has been mentioned as being used for flatulence, and in clean operation cases it is of course a most valuable drug. But in cases of peritonitis I prefer to withhold even pituitrin for the first forty-eight hours if possible, and to keep the intestines absolutely at rest. For the same reason aperients are entirely forbidden till the first week has passed, though liquid paraffin is usually given twice a day after the first two or three days.

"Earlier in these remarks it was pointed out that the treatment of peritonitis five-

and-twenty years ago appeared to be based on distrust of the peritoneum and intestines, and of their capacity to take care of themselves after an operation for removal of the septic focus responsible for the onset of peritonitis.

"The practice advocated now is based first on profound faith in the power of the peritoneum to resist and control infection, provided the main source of sepsis be removed and its mechanism be not interfered with by ungentle handling, by washing, by unnecessary drainage tubes or other foreign bodies, or by the administration of irritant poisons in the form of aperients; secondly, on realization of the truth and value of the great principle of rest to inflamed structures, as set forth by John Hilton sixty years ago."

CANCER RESEARCH AND ITS BEARING ON TREATMENT.

Bearing on cancer, always a problem of major importance, not only because of the apparent progressive increase in its incidence, but because it has already become nearly as devastating as tuberculosis and syphilis, the profession at large has for years believed that its etiology would be discovered, and, shortly following this, that means of prevention and cure would be devised. Throughout the scientific world, and for many years, individuals and groups, centering on the study of this problem, have reported progress, have indicated lines of promising research, and have left us with no larger practical knowledge of these growths than we had in the latter part of the last century, except that it is now well understood that in so far as surface cancers are concerned they may be produced by a variety of irritating agencies, if the latter be sufficiently long continued; that they inevitably may be produced by the *x*-ray, if a strongly irritating application is followed for a long period by repeated lighter dosages; that they may be cured certainly in their earlier stages by the *x*-ray or by radium; that they also may be cured in their earlier stages by prompt and complete removal.

There is much clinical evidence to show that internal cancers and particularly those of the stomach are implants on chronic ulcers; that in the whole intestinal tract this cancerous implant is prone to occur in regions of stasis and hence of irritation.

The optimist each year hails with no longer eager anticipation but with a glimmering spark of hope, the reports of the various individuals, commissions and groups concerned specifically with the study of cancer, nor is there any such report more worthy of careful consideration than that coming from the Cancer Commission of Harvard University. As a report of activities, and the cost thereof, it is a model for clarity, brevity, and truthful statement.

Bearing on the approach to the problem, Greenough recommends that "the work of the laboratories and of the hospital be continued as in the past, and the development of the science of biophysics and of its practical application to the study and treatment of cancer remain the chief activity of this Commission."

Simmons, the surgeon to the Commission, reports on the work of the Huntington Memorial Hospital to the effect that 1636 patients were treated during the year, that there were 7331 out-patient visits, and that the operating expenses were something over $65,000. Under Ill-defined or Unclassified Diseases there is the heading Apprehension; from the malady one man and four women suffered. There were 1062 cases of carcinoma, 45 of sarcoma, 53 of other malignant tumors, and 129 non-malignant tumors; 753 operations were performed during the year.

Dr. Minot's report as Physician to the Commission deals mainly with a study of the blood in cases of leukemia, polycythemia, and some atypical conditions.

The Social Service worker alludes to the Social Service Conference, which she states

"promises to be of great assistance to the Department in helping to decide the best way to give patients the most comfort."

Duane, the Research Fellow on Physics, reports that the extraction and purification of radium emanation and the preparation of applicators for treatment now go on in a perfectly routine manner. He has been busy in elaborating ionization methods of measuring both the intensity and the average wave-length of the rays, and has so succeeded that ionization methods of measuring now function in routine manner. He advocates measurement of the intensity and average wave-length of each beam before and during each treatment.

Dr. Bovie, Research Fellow on Bio-Physics, alludes to Dr. Stuart Mudd's studies of certain capillary electric effects of importance in the dynamics of living systems, of electrical endosmosis, of the electromotive force of filtration and cataphoresis, and finds that such studies have an important usefulness in laboratory work and a possible application to the problem of controlling infections.

Allusion is made to the work of Miss Daland, bearing on the effects of radium radiations on bacteria. She finds that "when suspensions of bacteria in solidified agar are exposed to a sufficient dose of radium radiation, a volume the outlines of which correspond to the surfaces of 'equal radiation intensity' is sterilized. When the organism used is Bacillus prodigiosus, the organisms surrounding this sterilized region develop an abnormally large amount of pigment and the colonies are larger than normal. This may be called a stimulating effect of a weak dose of radiation."

Bovie observes that the principal lines of research which have been carried on during the year and which are completed are:

The responses to light, the intensity of which is uniformly raised or lowered with succeeding exposures, the length of exposure being constant.

The response to various lengths of exposure under constant intensity of light.

The stages the nerve preparation passes through under constant conditions from the time of dissection until all response ceases —usually a period of about twenty-four hours.

Some phases of the experimental studies which have been touched upon but not completed are: (1) The effect of temperature; (2) flickering phenomena; (3) light adaptation; (4) the "I. T." law; (5) responses of the guinea-pig's eye.

Attempts were made to obtain the eyes of dogfish, which possess only rods, but they failed.

It must be confessed that, with due recognition of the enormous service rendered the individual by the Cancer Commission and its staff of able scientists, the average doctor will find little reason to believe from the reading of this report that the answer to the cancer problem has, as yet, been distinctly visioned.

Duane's work with radium and the *x*-ray makes a more direct appeal, because, incident to his studies supplemented by those of others, an increasing number of malignant affections are being cured.

Progress in Therapeutics

Medical Therapeutics

A New Proteid Silver Compound.

HAIR, in the *Canadian Practitioner* for June, 1923, states that it has long been recognized that silver in some form, especially silver nitrate, is one of the most efficient germicides for treatment of infections of the urinary tract. The anxiety of both patient and physician has prompted the use of silver nitrate solutions in the treatment of acute gonorrheal urethritis, resulting many times in an acutely inflamed urethra. This added irritation not only renders the local field more favorable to a further advancement of the infection, but dates the beginning of a troublesome stricture with more or less permanent damage to the tissues.

A recognized need for some form of silver that would more fully meet all the requirements prompted extensive investigation into the chemical possibilities. Silver in collodial form has met with considerable favor, although its rapid precipitation in aqueous suspension is a notable objection. The next effort was an attempt to combine silver with some proteid base. This seems to have come nearer the ideal form than any other silver preparation, as the viscosity assisted in holding the metallic silver in a more permanent suspension, and the combining of the silver with the proteid seemed to render it practically free of toxic or irritating effects.

A number of different proteid compounds have come to our attention, varying but slightly in physical properties, but all possessing a very objectionable staining effect. The laboratories of Parke, Davis & Company have recently produced a new silver proteid compound, called "Neo-Silvol," that seems to fully meet all the requirements of a silver proteid so far as its germicidal properties are concerned, and offers the unique advantage of being practically stainless.

During the past year he has used this preparation in cases of acute or chronic urethritis and cystitis with sufficient satisfaction to warrant special mention. True, it is not a cure-all in these troubles, and perhaps no antiseptic preparation ever will be, but, compared with some of the other solutions, it possesses decided advantages. In the early acute urethritis cases he used a ten-per-cent solution of neo-silvol by sealing in about 25 minims in the anterior urethra. This was repeated daily, if possible, for one week. If necessary after this time the solution was used in the same strength in the deep urethra. The results obtained were as follows:

1. There was a marked lessening of the discharge often even after one injection.

2. Posterior urethritis in some of the cases was absent, and if it did occur, was very mild.

3. The usual early urinary irritation was much relieved, often disappeared.

4. No chemical irritation resulted from its use.

In cases in which a posterior infection developed he was able to use a ten-per-cent solution of neo-silvol in the early onset as the symptoms were generally of a very mild nature. Even in cases of acute posterior urethritis, where any solution could be used, a ten-per-cent neo-silvol seemed to have decided effects in allaying the symptoms without producing any irritation.

In acute or chronic cystitis he found neo-silvol helpful by injecting into the bladder about one-half to one ounce of a ten-per-cent solution and allowing it to remain there until the next urination.

To summarize, then, neo-silvol has the following advantages in genito-urinary infections:

1. It appears to have decided germicidal value.

2. It produces no chemical irritation in

ten-per-cent solution strength and could, he is sure, be used in from five-per-cent to twenty-per-cent strengths.

3. It does not stain and is much cleaner to use.

4. It appears to allay the irritation of the inflamed mucous membranes.

Bismuth as an Antiluetic.

In its "Annotations" the *Lancet* of January 6, 1923, states that in a special number of *Le Paris Médicale* (December 2, 1922) devoted to recent advances in therapeutics, Émery and Morin, of the Saint Lazare Infirmary, Paris, remark that the most interesting therapeutical acquisition within the last few months is the use of bismuth in the treatment of syphilis. This is not an absolute novelty, since it had been employed by Balzer at the Lourcine Hospital in Paris as long ago as 1888, but it was only after the work of Saverac and Levaditi in 1920, following that of Sauton and Robert in 1916 on its use in trypanosomiasis and spirilloses, that bismuth became generally recognized as an antisyphilitic drug.

Investigations of numerous observers, especially those of Saverac and Levaditi, have shown that whatever method of administration or preparation of bismuth is employed, the active substance is metallic bismuth. Its mode of action therefore more closely resembles that of mercury than that of arsenic. In the course of its administration bismuth becomes widely disseminated throughout the organism, chemical analysis having shown it to be present in the blood, cerebrospinal fluid, and almost all the organs, especially the liver, salivary glands, heart, and spleen. It has been detected in bile, urine, saliva, sweat, and feces, in all of which it is rapidly eliminated. When used in suitable doses bismuth preparations have been found to be very active in all stages of syphilis, excluding parasyphilis. In the primary stage the time which the chancre takes to heal varies according to the size of the lesion; on the average it is 13 days with 4 injections, but it may be as short as 4 days with a single injection, or as long as 25 days with 8 injections. In the secondary stage the cure of mucous tubercles and oozing cutaneous surfaces takes place rapidly, and is effected on the average in 11 days with 3 or 4 injections.

Émery and Morin agree with Clement Simon and Bralez in regarding the action of bismuth as far superior to that of mercury, and comparable to that of large doses of arsenobenzene. The same is to be said of the action of bismuth in tertiary syphilis, for gummata and osteitis show much more rapid improvement than with mercury, according to these writers, whose views can be summarized as follows: Visceral syphilis, in particular gastric syphilis and aortic aneurism, is greatly benefited by injections of bismuth. In syphilis of the nervous system bismuth acts best on the recent manifestations of the secondary stages, especially on neurorecurrences. The best proof, however, of the activity of bismuth, according to Émery and Morin, is furnished by its effect on the Wassermann reaction. If the drug is employed early it prevents the reaction from becoming positive, while if it is delayed it renders the reaction negative, though not so rapidly as is done by arsenical compounds.

Among the numerous preparations of bismuth employed in the treatment of syphilis the most popular are the tartrobismuthate of sodium and potassium, hydrated bismuth oxide, and the iodobismuthate of quinine. Other preparations sometimes used are colloidal bismuth, precipitated bismuth, and ditrioxybismuthobenzol. All these preparations may be and are best given intramuscularly, though colloidal bismuth and ditrioxybismuthobenzol may also be administered intravenously. The advantages of bismuth medication consist in the fact that it is well borne, that it avoids the risks of arsenical preparations, that it occasionally is successful when arsenic fails, and that it apparently has a special action on neurorecurrences. Its drawbacks, such

as local pain, skin eruptions, stomatitis, constipation, or more rarely diarrhea, depression, and headache, are comparatively trifling, and are mainly due to unsuitable preparations or excessive dosage.

The writers believe that syphilis can be treated effectually in all its stages by bismuth alone but do not advocate an exclusive bismuth treatment, recommending that it should be combined with arsenical preparations, and to a much less extent with mercury.

Treatment of Duodenal Ulcer.

In *Minnesota Medicine* for January, 1923, WILLSON states that his ambulatory management is a modification of the Sippy diet; a milk and cream mixture with alkalies half-way between feedings. The quantity and timing of the feedings are dependent on the nutritional requirements of the individual and the time of onset of pain after eating.

Four ounces of equal parts of milk and cream every two hours with a half-teaspoonful of alkalies in the intervening hours is the most common starting-point. He never starts on a longer feeding interval, and shortens the quantity and time down to as low as one ounce every half-hour if indicated, the half-hour feeding being used only where alkalies are contraindicated as in alkalosis.

His experience is that the two-hour schedule will control distress in a large percentage of cases.

He has also discovered that all patients do not take kindly to a milk and cream diet, and occasionally he has to replace it with one consisting of such articles as cereals, starches, gelatin, rice, cooked eggs, etc., and even the Lenhartz diet, the timing and quantity being the same as in the milk and cream diet.

He expects a five to seven-pound weight loss in the first ten days, but does not allow this loss to exceed 5 per cent of the body weight, and the patient is brought up to normal food requirements as soon as possible.

After three or four days of the base diet a choice of one of the following items is added daily until four additional feedings are on the schedule. These feedings are limited in quantity to one ordinary coffee cup full and are given with one of the original feedings, this extra nourishment coming every four hours. The list of items to select from includes custard, cream of wheat, farina, corn-starch pudding, tapioca, malted milk, cream soups without meat stock (except tomato), soft eggs, egg-nog, and other similar articles. The alkalies are given between feedings, usually in half-teaspoonful doses, and are those ordinarily employed, consisting of a mixture of equal parts of soda bicarbonate and calcined magnesia (marked, laxative), and a second mixture of equal parts of soda bicarbonate and bismuth subcarbonate (marked, constipating). The patient is instructed to use the powder indicated by the bowel condition, and soon becomes expert in keeping the bowels properly regulated.

Complete relief of symptoms is expected within twenty-four hours, and if the plan first tried does not accomplish this the quantity, timing, type of diet, and alkalies are changed until such results are obtained and maintained.

The patient, after close supervision for the first three or four weeks, reports once a week, and new items of diet are added for variety and the quantity is gradually increased.

The timing of feedings is lengthened if all has gone well for seven or eight weeks, and the patient is given a small amount of several items three times a day at meal-times. The milk and cream is continued at meal-times and half-way between, and the intermediate feeding is kept up for several years. The alkalies are continued for a period of from three to six months.

He insists on complete control of the diet and activities of the patient for the first year and a more general supervision from that time on, requiring the patient to report twice yearly. They are warned to be particularly careful during the seasonal

periods of attacks, which are more often spring and fall.

Many patients give a history of marked regularity in attacks and others are very irregular, sometimes going years without symptoms. He gives patients who have been having attacks with fairly definite regularity very close attention over a period of time that would include three or four attacks.

The management of duodenal ulcer patients must be based on the study of the individual, and he has attempted to give only in a very general way the methods he has found most successful.

He concludes as follows: There are undoubtedly many so-called spontaneous cures.

Supervision covering a period of years is essential.

If a patient remains symptom-free over a period of time during which according to his history he would ordinarily have three or four attacks, the chances of permanent success are very good. However, he believes that five years or more of freedom from symptoms should be required to place these patients in the cured class.

The older literature on this subject is of little value except to show that many different diets and procedures have had their successes and failures.

He believes every duodenal ulcer patient, unless contraindicated on grounds mentioned in the body of this paper, should be given a "try-out" on ambulatory management. If satisfactory results are not obtained the patient has lost very little in risk, time, or money.

Nine and One-half Years' Experience with Artificial Pneumothorax.

RINGER, in the *New York Medical Journal and Medical Record* of January 3, 1923, states that the appearance of, or increase in, activity in uncollapsed lung is met with not infrequently by all doing much artificial pneumothorax work. The more careful one is in the selection of cases the rarer will be its occurrence. He is, however, of the opinion that in those cases in which artificial pneumothorax can be considered, and in which, unless collapse is obtainable, the outlook is absolutely bad, the risk should be run and the patient given the chance, for occasionally surprisingly good results will be obtained in cases showing both radiologically and on physical examination evidence of considerable activity in the relatively good side. These patients can often be helped and their remaining days made more comfortable.

The duration of collapse is an important question and is a difficult one to decide. In too many cases complications will decide it for us by forcing the discontinuance of injections. If no complications occur, the cases fall into three groups: (1) Cases with total collapse; (2) cases with partial collapse; and (3) cases collapsed for hemorrhage.

In his opinion cases with total collapse should be maintained for at least two years and even longer. We have no way of telling when healing is complete, and a perfect collapse is too valuable an asset to be lightly dispensed with. Post-mortem findings in such cases are too infrequent to permit of the formation of conclusions as to the time element necessary for permanent healing. Refills can now be so universally obtained that the question of the patient having to stay in one place does not enter into the matter. After two years or so it seems reasonably safe to allow reëxpansion.

The patients with partial collapse should be refilled indefinitely. The compression is not such as to bring about complete healing, and the benefit derived from compression is to be obtained only as long as it is maintained. If it is released, evidences of activity will almost invariably set in.

The cases collapsed for hemorrhage can further be subdivided into two: (*a*) Cases in which the opposite lung is free from disease; (*b*) cases in which the opposite lung is more or less involved.

Not infrequently patients are seen who

exhibit profuse hemoptysis and in whom artificial pneumothorax was not considered prior to the advent of bleeding, despite the fact that the process was wholly or mainly unilateral. If forced to collapse the lung to control hemorrhage, the collapse should be continued as though it had been begun in the absence of any emergency, as thus both subsequent bleedings will be avoided and new areas of involvement as a result of the hemorrhage will be nipped in the bud. In cases in which the opposite lung is more or less involved collapse should be maintained only until such a time as we feel reasonably certain that the bleeding point is firmly plugged. Singer knows of no guiding rule. He has however found, purely by experience, that from three to four weeks is a sufficient length of time to maintain the collapse, which should be kept under rather higher pressure than when done in the absence of hemoptysis. Needless to say, as this class of cases is unsuited for pneumothorax and the procedure is an emergency measure, the sooner the added strain upon the uncollapsed lung can be removed the better.

His experience in dealing with cases of artificial pneumothorax in abscess of the lung is small, but at the same time most unsatisfactory. The one brilliant result that he obtained was in 1912 in one of his first cases associated with Minor. A dying man was converted in a few weeks into a healthy vigorous individual who resumed his work and was eventually lost sight of. Other cases stand out in his memory in a very different light. In one a lung abscess that was being compressed burst into the pleural cavity with resulting death of the patient. In another practically the same thing occurred. In still another compression did no good and the patient eventually recovered, after having reached the brink of the grave and refusing surgical intervention, by the providential spontaneous rupture of the abscess into a bronchus. All in all he is not in favor of attempting to squeeze out an abscess of the lung by artificial pneumothorax. It is too much of a hit or miss method. Surgery is much better. Cases of lung abscess seen really in their incipiency offer a much better chance of cure by compression than do those seen when fully established. He has not had the opportunity to try compression upon any early cases.

Brilliant though immediate results frequently are in cases treated with artificial pneumothorax, the cold light of statistics shows that the percentage of permanent complete recoveries obtained is disappointingly small. Boas, from an experience of six years at the Montefiore Home, confesses frankly that "positive cure is too rarely accomplished. Generally marked improvement sets in for a time, and then some complication supervenes which causes the disease to resume its course. The patient often gets a reprieve of a year or two, and this means a good deal."

Ringer would not think, as a result of almost a decade of experience, of considering artificial pneumothorax as of little avail. In some cases it will actually drag a patient out of the grave and restore him to permanent and complete health. In many cases it will help—will inhibit the advances of disease and will prolong life—but a glance at the tabulation of any fairly large number of cases covering a few years will show tnat by far the greater number are either dead or wholly incapacitated. Nevertheless artificial pneumothorax succeeds in a sufficiently large percentage of cases to warrant its continued use, together with constant searching for better technique and improved methods to make the procedure more complete.

In his paper in 1917, Minor reported on one hundred cases of attempted artificial pneumothorax. Of his hundred cases, in eleven no entry was possible, and forty-four were classified as failures mainly because of the presence of adhesions. He reports on 101 cases occurring in his practice in which at least partial collapse was obtainable, thus eliminating the failures in the sense of no pneumothorax being obtainable.

He divides the 101 cases into five classes: Dead, dying, living; well, and unknown.

By living he means still in fair condition,

but pursuing their cure and incapacitated from work. By well he denotes those that have achieved a symptomatic and economic recovery.

Total Cases—101.

Dead.	Dying.	Living.	Well.	Unknown.
41	5	25	14	16

Eliminating the unknown class, there are left eighty-five cases upon which to base his results.

Dead.	Dying.	Living.	Well.
41 or 48.2 p.c.	5 or 5.8 p.c.	25 or 29.4 p.c.	14 or 16.4 p.c.

The five cases in the dying class if added to the dead class make a total of fifty-four per cent as practically dead.

Among the fourteen classified as well, three deserve special mention. Two patients recovered not because of but despite their pneumothorax. In one not the slightest effect was produced, and another was a case of lung abscess which finally ruptured spontaneously after artificial pneumothorax had been abandoned and surgery refused. The third patient, still under treatment, is a most remarkable one of spontaneous pneumothorax in an individual never having shown any symptoms of tuberculosis. The lung has expanded twice, only to have the pneumothorax recur. It is now being held down in the hope that the opening will permanently heal. Thus, subtracting the three cases just mentioned, there are but eleven, or 12.9 per cent of the eighty-five cases, that owe their recovery to artificial pneumothorax, not a large percentage when we consider that these 101 cases were all individuals in whom at least a workable collapse was obtained. Twenty-five others, however, are still living, and of these twenty-five, sixteen, while incapacitated from work, are enjoying fair health and are not bedridden invalids. This brightens the picture. Thus out of 101 cases fourteen are well and sixteen able to lead a life limited, it is true, but still not that of one hundred per cent invalidism. This gives an aggregate of practically thirty per cent showing marked improvement and freedom from absolute invalidism, surely a number amply justifying the use of artificial pneumothorax.

To epitomize briefly conclusions reached as a result of nine and one-half years' experience with artificial pneumothorax, Ringer says it can be asserted that the method is distinctly valuable, and one which no man devoting himself largely to pulmonary tuberculosis can afford to neglect. Its applicability will of course vary with the personal opinion of each one that uses it. To some the field will widen, to others it will contract. Immediate results are often surprisingly brilliant; the percentage of really permanent arrests is disappointingly small. Its use in hemorrhage is of the greatest value. It is often an immediate life-saver, frequently a life-prolonger, not seldom a bringer of comfort and relative relief from distressing symptoms. Finally it is the one method at our command that offers to the far-advanced unilateral or relatively unilateral cases a good chance of further longevity, and a reasonable chance of economic recovery.

Diabetic Toxemia.

ALLEN, in the *Journal of the Medical Society of New Jersey* for January, 1923, acknowledges that diabetic acidosis remains an extremely dangerous complication when it has been allowed to develop to the stage of coma or pre-coma. The earlier stages are generally easy to check. The cases which he cites were in an advanced stage when seen, as is sufficiently indicated by the mortality. No patient has developed coma or serious acidosis under his treatment, for when the undernutrition régime is properly carried out there is no need for such accidents. His results in attempting to treat the extreme stages of diabetic acidosis have been bad, as shown by the fact that six patients died and only three survived. The majority of these patients received sodium bicarbonate in various ways and quantities, mostly by mouth. Joslin uses no alkali, and his results, which he has partly published and doubtless will later publish more fully, are the best ever recorded, as judged by the fact that he has saved a greater number of patients having lower plasma bicarbonate

figures than any other writer. The difference in methods between the different persons who use the newer diet methods is really slight, as it pertains to only a few cases. There is seldom any need for soda, and most competent judges will doubtless agree that the more moderate degrees of diabetic acidosis can be cleared up easily and smoothly by diet alone. It is a natural inquiry why we cling to the use of bicarbonate in the small number of desperate cases, if statistics carry any weight and if Joslin's results appear better than others.

The high mortality is due to the excessive severity of his cases. This cannot be proved by the plasma bicarbonate figures, which were higher than those in a number of the acidosis cases in the Rockefeller Institute series which recovered. This bicarbonate level was due to the considerable quantities of alkali which most of these patients had received before he saw them, and which, according to Joslin's view, might increase their danger. Second, the results in the cases treated without alkali were as fatal as those in the cases with alkali, and the three patients who recovered were among those who received alkali. Third, in two instances progress which seemed highly unfavorable under treatment without alkali was apparently turned to recovery by administration of sodium bicarbonate.

However this question may be decided, there can be no doubt of the great service rendered by Joslin toward correcting the prevalent abuse of alkali. Not only has bicarbonate been used to the exclusion of more rational measures for dangerous acidosis, but many physicians have prescribed it as a routine upon the first appearance of acetonuria or even at the first diagnosis of diabetes. Attention should be centered upon preventing the formation of acids rather than upon attempts to neutralize them. Therefore the milder grades of acetonuria are cleared up by stopping the loss of sugar in the urine and by properly balanced diets. For impending coma, the most important measure is the withdrawal of all food except the carbohydrate of citrus fruit juices, made into drinks for administering maximal quantities of fluid. Vigorous purgation apparently helps. Additional fluid may be given intravenously or subcutaneously when needed in the form of saline solution. Alkali injections are sometimes dangerous and seldom if ever helpful, but he has observed no harm from reasonable doses of sodium bicarbonate by mouth or rectum during the emergency. All are agreed upon the principal features of this plan. If the mortality from coma can be reduced as low everywhere as in Joslin's clinic, the question of alkali will be seen to have small practical importance.

The Use of Adrenalin in the Stokes-Adams Syndrome.

FEIL, in the *Journal of the American Medical Association* of January 6, 1923, concludes that there is clinical evidence that the subcutaneous injection of adrenalin in cases of partial heart-block may overcome the delay in conduction, restoring it to normal; in 2:1 block, the mechanism may be restored to normal or dissociation may follow. In complete block, normal sequence may result or no change occur. In the latter event acceleration of the auricles and the ventricles usually results. In cases of frequently recurring attacks of Stokes-Adams' syndrome, the syncopal attacks may be abolished. From the clinical report of the English observers and from his report the effect of the subcutaneous injection may be said to last about twelve hours. The dose administered to adults of average weight is from 0.3 to 0.6 cc of a 1:1000 solution, injected subcutaneously.

The danger in administration of adrenalin to patients with a considerable degree of arteriosclerosis or with hypertension (and in many cases of complete heart-block there is an elevated systolic maximum pressure) must be weighed against the dangers and the discomfort of the syncopal attacks. Doubtless, adrenalin therapy is justified in the treatment of patients with frequently recurring syncopal attacks, in view of the usual urgency of the patient's condition and because of the satisfactory re-

sults obtained in the reported cases. In no event should adrenalin be administered intravenously.

The use of adrenalin subcutaneously offers relief from Stokes-Adams' attacks and doubtless stimulates the new center of impulse formation in complete heart-block, by way of the sympathetic endings. There appears to be little or no danger in the use of adrenalin in this type of case when it is properly administered. Intravenous injection results in greater concentration of adrenalin in the blood stream, and it is this factor that is probably responsible for the grave reactions reported in the literature.

The Treatment of Pernicious Anemia.

In discussing the paper of Colwell on this subject in the *Pennsylvania Medical Journal* for January, 1923, LICHTY reasserts the fact that pernicious anemia is a fatal disease. In fact, if the patient does not die we are doubtful of our diagnosis. The treatment of pernicious anemia, with our present knowledge, has relation to the point as to whether we may do something which will cure the patient, or if we cannot, whether we can do something that will at least prolong the life of the patient or make him more comfortable. So far no one has essayed to say that he has found a cure for pernicious anemia.

Colwell has given us a very excellent illustration of the effect of transfusion, at least in so far as the immediate results are concerned. He very wisely allows us to draw our own conclusions.

Lichty states that he has tabulated 115 cases since 1894 until the present time. Some were seen in consultation only. Many of them were treated by him, and he has full records on at least 49. The records of the others are not completed. They have not died yet, or they have passed from observation. Of these 115 he has one that is living after fifteen years, so far as he knows. He was cured apparently by an attack of typhoid fever and by living in a higher altitude. He is in Colorado now. He has three who lived eight years. One was splenectomized and transfused. The other two were only transfused. These three are now also dead.

In the general treatment of these cases he has gone down through everything done since 1894—arsenic, including arsphenamine, hydrochloric acid and pepsin, forced feeding, irrigation of colon, calcium carbonate, glycerin, or whatever has been suggested from time to time, and finally transfusions, which he has had done routinely now for the past eight or ten years.

Such a paper as Colwell has presented is a very necessary paper because it enables us to estimate the value of a certain treatment which is now popular and extensively employed. Transfusion entails a great deal of trouble to the patient. It is not an inexpensive procedure. Frequently the whole family is concerned. It entails a great deal of technique. Even though carefully done there is at times a chill and fever, and there may be bad results, sometimes a fatality.

Of the 49 cases of which he has definite records and which died, 14 were transfused and 35 were not transfused. The 14 are of the more recent and the 35 of the earlier cases. Of the 115 cases, 27 in all have been transfused; 14 died, and 13 are still living but will die later. As to the results of these cases that were transfused he can only give impressions, because we do not know the possible course of the case from the beginning.

For example, a case of pernicious anemia comes, and after one makes the diagnosis, whether the case is recent or of long standing, transfusion is undertaken. Most of his cases came to him two and a half years after the anemia had begun. From the history, blood picture and physical findings, one has a concept as to how long that patient may live. Suppose one gets a patient who should probably live three years. The question now is, if transfusion is done, is that patient going to live longer than three years or is he going to die sooner? Lichty is sorry to say that the impression he gets

from his work is that he will die sooner than the three years. It seems that the transfusions rather hurry the patient through the remissions due him. For that reason he questions whether we should go on with transfusion, at least as a routine treatment.

This opinion comes from a long experience in his own work. His patients, since he has been transfusing, do not seem to have the long intervals of well-being that they used to have when he used only hydrochloric acid and pepsin and arsenic, with hygienic measures. Perhaps he sees more difficult cases now than he used to see. He does not see the patients who had the long remissions or long intervals when they seemed to be well.

It appears to him, as Maclachlan has expressed it, that the patient is due for just about so many remissions, and if we begin to transfuse we have them just a little more rapidly. Whereas if we let him alone or treat him as we did before the era of transfusions he will live longer. This is his impression.

It is a wonderfully attractive thing to transfuse, because you can demonstrate the results to the patient and to his frineds so easily. The immediate results tabulate beautifully. It is inspiring because the patient is immediately better. But, after all, is he going to live longer? Lichty does not believe that he is.

Another point is that we do not know what causes pernicious anemia, and yet we do some very definite things for it, such as transfusion. Suppose a surgeon has a case of internal hemorrhage from a ruptured spleen, for example, and the patient is very ill and in collapse. For some reason he decides not to operate at all, but attempts to save the life of the patient by transfusing instead of by opening the abdomen and doing a splenectomy. Lichty does not get any more satisfaction from transfusing in pernicious anemia than he believes the surgeon would get from transfusing routinely in the case of unknown internal hemorrhage.

He believes that transfusion in pernicious anemia will be done less frequently in the future, and that we can get just as good or probably better results from the old line of treatment. Only in the very grave cases in which there is immediate danger will it be indicated and justified.

Treatment of Syphilis in its Later Manifestations.

HARRISON, in the *Lancet* of January 6, 1923, states that the correct treatment of syphilis of the parenchyma of the central nervous system has aroused great discussion, particularly in America, where the protagonists and the opponents of the Swift-Ellis and the Ogilvie methods of intrathecal injections wage fierce battles. Both these forms of treatment depend on the principle that, since arsenobenzol introduced into the systemic circulation does not reach the parenchyma of the central nervous system, it is better to put it into the subarachnoid space, where it will mix with the cerebrospinal fluid and so be brought into contact with *S. Pallidum* buried in the parenchyma of the central nervous system. Excellent results are claimed for this form of treatment, and he has himself seen cases benefit by it who were not progressing well on the ordinary intravenous or intramuscular treatment, but, like many others, he is uncertain as to the rationale of it.

At least three factors are concerned in intrathecal therapy: the intravenous injection, the lumbar puncture, and the introduction of the salvarsanized serum. Intravenous medication usually acts well. Lumbar puncture alone has also an effect on tabes, as he has seen two cases in which the mere withdrawal of a few cubic centimeters of cerebrospinal fluid resulted in recovery of power by a previously paralyzed bladder. Both these factors have to be reckoned with in the usual intrathecal therapy. What about the effect of the third? Is it because the medicament introduced into the spinal canal acts more potently on the spirochetes in the parenchyma, or is it because of some nonspecific action, whether it be from assisting

the passage of the drug from the systemic circulation to the lymph of the central nervous system, or in some other way? It seems to him at least open to doubt whether the cerebrospinal fluid is the lymph of the central nervous system and does therefore come into contact under natural conditions with the parenchyma. He admits that substances introduced into the cerebrospinal fluid can be forced back to the neighborhood of the pyramidal cells, but he feels some doubt about its occurring under natural conditions. The cells of the nervous system are highly organized, and the liberality of their blood supply indicates a large requirement in food, while the cerebrospinal fluid is such thin stuff that one wonders how it could possibly contain the required nourishment.

Some work by Wynn seems to indicate that even when arsenobenzol introduced into the spinal canal is brought into close contact with the brain parenchyma the results are indifferent. Thus intravenous injection of 15 per cent salt solution results in the cerebrospinal fluid being drained back into the systemic circulation, as shown by Weed and McKibben and by Foley and Putnam, and iron salts introduced into the spinal canal of animals prior to this internal drainage are found later in the vicinity of the pyramidal cells. Wynn gave 200 cc of 15 per cent saline intravenously to human beings and at the same time introduced salvarsanized serum into the spinal canal. As mentioned, the results in a number of cases were indifferent, and Wynn concluded that intraspinal injections combined with internal spinal drainage was of no therapeutic value. His experiments seem to show that intraspinal therapy is of no value unless combined with antisyphilitic treatment by the systemic route. Further, since in these cases the drug was brought into far closer contact with the parenchyma than occurs under the ordinary conditions of intraspinal treatment, it seems reasonable to suppose that the drug injected into the subarachnoid space does not act by virtue of any spirocheticidal effect.

Another form of treatment of parenchymatous nerve syphilis is that introduced by Gilpin and Earley and advocated strongly by Dercum. The principle is to assist penetration of the drug given into the systemic circulation by lowering the intrathecal pressure. The patient receives a full dose of an arsenobenzol preparation, and in the next half-hour or so as much fluid as possible is drawn off by lumbar puncture, the idea being to break down the resistance of the cerebral vessels to the transudation of arsenobenzol by exerting a strong pull from the subarachnoid side. He has tried this form of treatment in some cases of G. P. I., and they have done well, but he has also given very large doses of silver-salvarsan at the same time and is not quite sure how much the drainage contributed to the result. Excellent results have, however, been claimed for the method by Hearn working at the London Lock Hospital, and he employed only ordinary doses of arsenobenzol. Regarding the drainage method of treatment in tabes, his experience leads him to recommend some caution. Cases of tabes seem to be much more sensitive than others, not only to excessive individual dosage, but to excessive drainage, as he has seen them made definitely worse by both faults in treatment. He has seen cases of tabes benefit by simple lumbar puncture, removing only a few cubic centimeters of fluid, but that is different from the removal of 40, 50, or even 80 cc of fluid, as is done in the Gilpin-Earley method. So he tries an ordinary lumbar puncture first to see how the patient stands it, just as he always tries very small doses of arsenobenzol, and watches pretty carefully before venturing on increases.

Another method of carrying out the Gilpin-Earley principle of spinal drainage has been suggested by Corbus, O'Conor, Lincoln, and Gardner. It is based on the effect of intravenous injection of hypertonic saline, which he has mentioned before in connection with the work of Wynn. The patient receives, say, at 10 A.M. an intravenous injection of 100 cc of 15-per-cent sodium chloride solution. The effect of

this is to cause an enormous reduction in the cerebrospinal fluid, as has been proved on animals. About 4 P.M., when the tide of cerebrospinal fluid is well on the turn, so to speak, flowing back to the subarachnoid space, the patient receives a full dose of an arsenobenzol compound, and, after being in bed all day, is allowed to go home at 9 P.M. Corbus and his colleagues found that, after five such treatments at weekly intervals, arsenic could be demonstrated in the cerebrospinal fluid in 26 out of 28 cases, a higher percentage than has been attained by other means. He has had no experience with this form of treatment.

With reference to the lines on which he would actually treat a case of tabes, generally he would reserve intraspinal medication for cases which resisted the ordinary methods. That is, he thinks, common sense, as all forms of effective treatment make great demands on the patient, and lumbar punctures are not too pleasant an addition. He likes best to combine intravenous injections with deep subcutaneous injections. For the intravenous, he prefers silver-salvarsan to all others, and for the subcutaneous, sulfarsenol, because it hurts less. Patients vary greatly in their susceptibility to pain after sulfarsenol injections, but generally stand them well, especially if each is preceded with 0.5 cc of 3-per-cent novocaine injected through the same needle. He starts with very small doses, and watches to see how the patient tolerates them. For instance, 0.05 g. silver-salvarsan given intravenously is followed in three or four days by 0.12 g. sulfarsenol given subcutaneously. The dose is increased gradually to 0.3 g. silver-salvarsan, and 0.48, 0.54, or even 0.6 g. sulfarsenol until the patient has received about 2.5 g. silver-salvarsan and about 4 to 4.5 g. sulfarsenol. Then the injections are stopped for six to eight weeks while the patient receives, first a course of two or three weeks' iodide, and then yellow iodide of mercury by mouth. Sometimes he has to treat only with silver-salvarsan, and sometimes only with sulfarsenol, because the patient tolerates one of these better than the other. If sulfarsenol is the only arsenobenzol remedy, he gives mercury by injection or by mouth at the same time, and he always gives iodide at the end of the course. Harrison always tells the patient that he must expect to remain under treatment by regular courses of injections, with intervals during which he will be taking some form of medicine, for quite two years, and if he is one who thinks that he will leave the decision as to further treatment to the result of the first course, he prefers that he shall go to some one else. He thinks that if a patient will comply with the conditions, one can offer much in tabes, even though there may be a fair amount of ataxia. The halo of meningitis often disappears fairly quickly, and a particularly pleasing result of treatment with silver-salvarsan has been the disappearance of lightning pains. As a class he says the tabetics attend his department at St. Thomas' Hospital more faithfully than any other, mainly, he thinks, because of the relief given them in this direction. If a patient does not progress well enough or at all on the lines he has mentioned, he has in reserve for him intraspinal medication or else drainage, either, of course, combined with systemic treatment.

Treatment of Eclampsia.

Writing in the *Virginia Medical Monthly* for January, 1923, EARLY states that the time-honored principles of curative treatment of toxemic convulsions are: First, the control of the convulsions; second, the elimination of the poison; third, the termination of the pregnancy.

Eight to ten per cent of eclamptic patients will die, no matter what treatment is used, and eighty per cent will recover under a conservative treatment which does not include shock-producing drugs or an operation. The treatment as applied may be aptly divided into the ultra-radical, which

includes incision of the cervix, difficult forceps application, and abdominal Cæsarean operation, and the ultra-conservative, which relies on morphine and eliminants.

He believes a course between the two or a reasonable conservative treatment is best. So long as eclampsia is a mystery, a disease of theories, no treatment is applicable to all cases.

We cannot individualize all our cases, toxemia being the underlying cause whether from liver, kidney, or acidosis.

In a particular case an ultra-conservative treatment might cause more harm than an ultra-radical treatment, and *vice versa*. The ultra-conservative treatment might be accepted by all if it were not for the fact that the shorter the interval that elapses between the first convulsion and the emptying of the uterus, the better the prognosis for the mother and the baby.

Given a case of convulsive toxemia, a half-grain of morphine should be given hypodermically, and the patient placed in bed in a darkened, well ventilated room. Quiet and fresh air are very essential. Chloroform, nitrous oxide and ether are to be avoided if possible, but if any are used, ether is to be preferred.

Long-continued use of any anesthetic lessens the patient's chances. A catheterized specimen of the urine is obtained for examination. The stomach is washed out with a sodium bicarbonate solution, and about two ounces of magnesium sulphate solution is injected through the tube before it is withdrawn and allowed to remain; some prefer castor oil, and in desperate cases three or four drops of croton oil in sweet oil may be inserted. A colonic irrigation with a solution of bicarbonate of sodium is also given.

Morphine is repeated in doses of 1/6 to 1/4 grain as is indicated, trying to keep the respiration between ten and twelve per minute. Glonoin is used as a diuretic and antieclamptic, the latter indication being fulfilled by lowered high blood-pressure. A full dose of sodium bromide in solution is given by rectum in extremely nervous cases. Some use chloral hydrate, but sodium bromide will usually suffice and is not so dangerous.

Bloodletting is used, and in some cases he has thought it beneficial; in others it did no good and possibly harm. In cases in which the convulsions recur frequently in spite of treatment, in which the pulse is full and strong, the face flushed or cyanotic, bleeding will do good. In cases of opposite type it is a procedure of doubtful utility. It should, if possible, be reserved until after delivery, as a hemorrhage at birth may make further bleeding unwise.

He has always been disappointed in the use of veratrum viride and has practically stopped using it. Some place great reliance on it. With a strong rapid pulse it offers great benefit, the pulse-rate being lowered by the drug. Convulsions are unknown when the rate is 60 or under. The patient should be kept in the recumbent position while it is being used. In his cases it apparently increased the shock.

Sweating is obtained by the hot pack, with symptoms of heart failure carefully watched.

A multipara with no obstruction and with prospects of a comparatively short labor is a good patient for the conservative morphine eliminative treatment. A primipara with slowly dilating cervix and possibly 20 hours' prospective labor is not such a good risk, and unfortunately convulsions are more often seen in them.

The treatment of convulsions, as above outlined, is practically accepted by all obstetricians, except in minor points, but whether the pregnancy should end spontaneously or by artificial means has caused endless discussion. Opposed to the conservative plea as previously mentioned is the fact that the shorter the time which elapses between the first convulsion and the termination of the labor, the better the chances for the mother and the child. While on the other hand eclamptic patients make the worst surgical risks, owing to shock from operation and shock from cardiac depressants like veratrum viride, phlebotomy, and oversweating.

If under a conservative treatment the

toxemia steadily grows worse, the labor should be terminated as soon as possible, both from the standpoint of the mother as well as that of the baby; more of the latter are saved if the condition is not prolonged.

The method of delivery depends on many things: period of pregnancy, environment of patient, state of cervix, skill of operator, and complications such as a contracted pelvis, placenta previa, etc.

Before the seventh month all babies die, so enough dilatation to do craniotomy and extraction is all that is necessary. After the seventh month efforts should be made to save the child as well.

If the cervix is dilated and the head engaged, delivery is accomplished at once by forceps. If the head is not engaged at the brim, version should be done. If the cervix is shortened and a comparatively thin elastic border remains, it can be dilated with the fingers or some of the metallic dilators, labor being terminated by forceps or by version. Sometimes in hydramniotic cases or in twin pregnancy, rupture of the membrane and escape of large quantities of the amniotic fluid will lessen the convulsion. The beneficial effect obtained from the removal of the child and uterine contents seems in many cases to be a pressure relief, pressure on the kidney, renal vessels, intestines, portal circulation, or liver.

Until we know more of the cause of eclampsia, abdominal Cæsarean section will always demand a place in the treatment. Given a primipara with a long bottle-necked undilated cervix and 20 to 36 hours of possible labor before birth, abdominal Cæsarean section must be considered. Certainly twenty to thirty minutes' operation as compared to 20 to 36 hours of labor, terminated by high forceps and traumatism, is the better chance and offers the best results to both mother and child.

In pregnancy, during the first stage of labor, the barrier offered to rapid delivery is the undilated cervix, and it is just here that many obstetricians differ in their method of procedure.

Expectant or palliative treatment in many cases will be followed by death of the child, and in about one-third of the cases the mother succumbs. The popular method of the present day seems to be the mechanical dilatation of the cervix and prompt extraction of the fetus. This method is all rgiht if it can be done in a safe period and without damage to the uterus.

Certain cervical conditions may exist, as previously mentioned, which prevent mechanical dilatation in a reasonable time or result in great damage to the lower uterine segment.

During the delivery of eclamptics, as strict asepsis as is possible should be observed, because they are particularly liable to infection, the liver and kidneys being weakened and their immunizing power lessened.

In conclusion, Early makes a plea for more work along the line of preventive treatment since the convulsive stage is attended by a high mortality of both mother and child, no matter if she has the attention of a most skilled obstetrician. If all women, and particularly young women, would present themselves to their medical adviser as soon as pregnancy occurs, many cases of convulsive eclampsia could be prevented, and those cases which are not responding to treatment could be terminated early in pregnancy before serious damage has occurred.

The Therapeutic Use of Bacillus Acidophilus Milk in Richmond.

In the *Virginia Medical Monthly* for January, 1923, REDDISH and MILLER state that the principle upon which the therapeutic use of bacillus acidophilus is based is both logically and scientifically sound. Implantation in the intentines of an aciduric organism of intestinal origin will displace, in large measure at least, the harmful and putrefactive types. Such a condition, since it brings about a simplification of the intestinal flora and substitutes helpful bacteria for harmful ones, is most desirable in the alleviation of certain chronic intestinal disorders. This change

in bacterial flora can be brought about in two ways: by encouraging the aciduric organisms already present in the intestines by supplying the proper food, and by administering living cultures of such organisms. The former method is best accomplished by the ingestion of lactose or dextrin; but living, viable cultures in milk or broth when taken in rather large amounts will produce the same effect more quickly and with less discomfort.

In the present report, young milk cultures of B. acidophilus were used for this purpose. Simplification of the flora was accompanied by a distinct improvement of the condition of the patients in almost every case. Chronic constipation and colitis were treated with success in every instance. A very marked improvement in diarrhea cases was noted after eight days' treatment; in all probability complete relief would have been effected if it had not been necessary to stop the treatment. The one case of arthritis treated did not respond to protracted use of the acidophilus milk, even when supplemented with lactose. In all probability the condition was not due to autointoxication, as was at first suspected.

The cases reported show a variety of conditions which had not responded well to other treatments, but which were definitely alleviated by the acidophilus milk treatment. There is, therefore, a definite place for such a therapeutic agent as Bacillus acidophilus in the general practice of the physician.

Intraperitoneal Transfusion with Citrated Blood.

SIPERSTEIN and SANSBY, in the *American Journal of Diseases of Children* for February, 1923, in their conclusions, state:

1. The intraperitoneal transfusion of citrated blood in rabbits is a safe procedure, simple to apply and efficient.

2. Absorption of blood from the peritoneal cavity of rabbits takes place very rapidly. A rabbit can apparently absorb approximately one-fifth of its own blood volume in four hours.

3. The intraperitoneal transfusion in both anemic and normal animals causes a sharp, temporary rise in blood values during the absorptive period. This is followed later by a more permanent increase in the blood picture.

4. Studies at necropsy when considered with the blood counts would apparently indicate that the initial rise is due to an actual absorption of red blood cells from the peritoneal cavity, and not merely to a concentration of the blood volume.

5. Pigeon's blood injected subcutaneously in rabbits apparently does not enter the general circulation in demonstrable amount. The same blood injected intraperitoneally is absorbed very rapidly.

6. The intraperitoneal transfusion of freshly citrated blood acts as a true transfusion and not as the absorption of a nutrient material.

7. The intraperitoneal route for blood transfusion is proposed as a therapeutic method of merit.

Clinical Uses of Hypertonic Salt Solution.

WYNN, in the *Indianapolis Medical Journal* for February, 1923, states that from his experiments with hypertonic saline solutions the following conclusions seem warranted:

Hypertonic saline injections—as much as 200 cc of 15-per-cent solution—can be given to a normal individual intravenously. The resultant changes in blood volume and salt content are extreme but transient, and attended by no particularly alarming symptoms.

Such saline injections are not followed by appreciable changes in the blood-pressure, even when given repeatedly over a period of weeks.

Hypertonic saline injections are of little value in augmenting the intraspinal treatment of neurosyphilis.

Hypertonic saline injections have a dis-

tinct field of usefulness in brain tumor cases (especially those associated with high degrees of intracranial pressure and hydrocephalus) in (*a*) relieving distressing pressure symptoms, and thus (*b*) making more accurate localization possible in some cases, and (*c*) decreasing tension during operative procedures, thus (*d*) decreasing the anesthetic hazards.

Oxygen Therapy in Premature Babies with Anoxemia.

BAKWIN, in the *American Journal of Diseases of Children* for February, 1923, states that the oxygen unsaturation of blood from the longitudinal sinus of well infants varies from 5.1 to 8.3 cc, averaging 6.7 cc.

The oxygen unsaturation of longitudinal sinus blood in two prematurely born babies with marked cyanosis was 14.8 and 13.1 cc, respectively.

These two prematurely born babies with marked anoxemia, as indicated by the cyanosis and the increase in the oxygen unsaturation of the venous blood, were treated with oxygen inhalations. In both instances the cyanosis disappeared and the saturation of the venous blood rose to normal.

Oxygen may be given effectively to prematurely born babies through nasal catheters or through a rubber tube inserted into the mouth.

Magnesium Sulphate as a Sedative.

WESTON and HOWARD, in the *American Journal of the Medical Sciences* for March, 1923, state that pure, recrystallized magnesium sulphate with its water of crystallization was made into a 50-per-cent solution with distilled water and sterilized. The solution was injected subcutaneously and intramuscularly more than a thousand times. No local pain or sloughing occurred when proper aseptic technique was used. In 82.7 per cent of the cases the sedative action was prompt, the patient becoming quiet after fifteen or thirty minutes and sleeping from five to seven hours. In a few instances the patient became quiet but did not sleep. The effect persisted for from five to ten hours. The salt was found to be a very excellent substitute for morphine and hyoscine in many cases. It was found necessary to repeat the dose of 2 cc in 6 per cent of the cases before sedation was obtained. In 11 per cent of the cases no effect at all was noticed after the injection of three or more doses. The salt is quite harmless in the dose necessary to produce a sedative effect and can be given liberally when necessary. No opportunity has presented itself for using the salt in preoperative or postoperative cases or in acute thyrotoxicosis.

Tumor Formation after Injection of Mercuric Salicylate in Vegetable Oil.

SUTTON, in the *Archives of Dermatology and Syphilology* for February, 1923, states that owing to asepsis and the selection of the less irritating mercury salts, nodosities following the deep injections of mercury are rather rare. When they do occur they are due to: (1) the use of mineral oil as a vehicle for the salt; (2) reaction from the presence of mercury; or (3) traumatic gummas.

By far the greatest number of nodular lesions at the site of puncture are due to the use of mineral oil as a vehicle for the mercury. In spite of the wide publicity that has been given the dangers from its use, liquid petrolatum still enjoys a dubious popularity. When severe local reactions follow the intramuscular injection of mercury in vegetable oil, it is conceivable that the element itself is at fault, or that the resulting lesions are expressions of allergy and are, therefore, traumatic gummas. The nature of the reaction can be ascertained from the clinical picture and from examination of the oil, and by an early Roentgen-ray examination and by biopsy.

The X-ray Treatment of Thyrotoxicosis.

TROSTLER, in the *Illinois Medical Journal* for January, 1923, contends, and has for the past ten years contended, that *x*-ray therapy is the treatment of choice for hyperthyroidism. Briefly his reasons for this are as follows:

Because no harm can result, and past results show that the method has cured many and relieved all others treated.

There is no operative risk.

There is no confinement to bed. (Crile, in the above-mentioned paper, reports an average period of confinement in bed of 25¼ days in a recent series of 500 cases.)

There is no fear of operation, neither by the patient, her family, friends, or her physician.

There is greater likelihood of cure and less likelihood of recurrence, with the additional assurance that we still have the same means and methods of treatment if recurrence takes place.

There is likelihood of earlier relief of the most urgent and pressing symptoms and of ultimate cure in a shorter time, consequently a shorter period of disability.

There is no scar on the neck.

He made these claims, with a full knowledge of how seemingly revolutionary they were, several years ago, and up to this time has not had to retract any of them.

The general medical profession is waking up to the efficiency of *x*-ray therapy in toxic goitre. Ford Morris, Jr. (in the *Medical Record*, Sept. 11, 1920), said in part: "The *x*-ray is a most excellent agency for depressing the excessive secretion of the thyroid. Knox reminds us of several precautions to be taken in giving *x*-ray treatments, such as careful estimation of dosage on each occasion, adequate filtration, the use of a penetrating ray, and the use of secondary filters of leather, etc. The thymus should also be *x*-rayed each time."

When medical men of the standing of Means of Boston strongly recommend the use of *x*-rays in the treatment of toxic goitre we can rest assured that it is about the "last word."

Trostler asks, how does *x*-ray therapy accomplish these seemingly marvelous results, How can the activity of the thyroid gland be so markedly affected?

To the initiated this is very simple. The *x*-rays have selective action upon glandular tissue, and because of this selective action the thyroid gland is particularly susceptible to its effect.

By lessening the activity of the glandular epithelium primarily and by causing a proliferation of the cells of the intima of the blood-vessels and a consequent obliterative endarteritis in the gland, a more or less prompt reduction in the output of thyrotoxin is effected. By the primary inhibitory effect upon the gland cells the activity of the gland is immediately influenced, and by the obliterative endarteritis a reduction in the amount of blood passing into and through the gland is effected and atrophy begins. This effect is exactly like ligating some of the arteries without the undesirable complications. It is gradual, without systemic shock of any kind, and is as sure as ligation, without the surgical risks. Less blood is supplied to the gland and it slows down its function, reduces the amount of thyrotoxin it produces and sends out into the circulation, and we have an early reduction of the thyrotoxicosis. Besides the action upon the blood-vessels, there is, as before stated, a marked sedative action upon the actively functioning gland cells, which is in a large measure the cause of the early effect of the treatment.

This reduction of the thyroid activity is continued until we have arrived at what seems to be the normal activity for that individual, when the treatment is discontinued and the patient kept under observation by her family physician. The basal metabolism test is used to check up the activity of the gland when desired.

DaCosta, who is one of America's leading master surgeons, reported that he had his Basedow's disease patients subjected to *x*-ray therapy before he operated on them, in order to lessen the vascularity and reduce the toxicity of the gland. The Mayos

of Rochester do the same in toxic cases. If these eminent surgeons would permit the eradication to continue, they would not need to operate on 10 per cent of these cases.

Case, a well-known surgeon and radiologist, recently stated that no more operations for toxic goitre were done at Battle Creek, all of them being treated by *x*-ray therapy.

From Trostler's past experience he has found that it requires from four to eight full dosage treatments to effect a cure. If the patient is extremely toxic, full dosage treatment cannot be administered at the beginning, but if not very toxic the treatments are administered in full dosage about every twenty-one days, and the patient is kept under the observation of the family physician in the interval between treatments.

The Treatment of Diabetes Insipidus by Intranasal Spraying of Pituitrin "O."

BLUMGART, in the *British Medical Journal* of February 24, 1923, stated that there is a group of cases of diabetes insipidus in which the cause cannot be ascertained. In 1913 it was discovered that the introduction of extract of the posterior lobe of the pituitary body checked to a considerable degree both the polydipsia and the polyuria. But the effect was only transitory, as six hours after the treatment the patient was as bad as ever. Attempts had been made to introduce the extract by the rectum, and also by the mouth, but there has been practically no effect from these methods in the hands of some, though a few workers claimed results from them. In one case he and his colleague found that 1/5000 cc of pituitrin caused a drop in the urinary output and an alleviation of the thirst. He had experienced the best results from intranasal spraying with pituitrin. He used for this purpose Parke, Davis & Co.'s Pituitrin "O." The method had to be continued regularly, otherwise the case relapsed. In all the cases benefited by the subcutaneous use of the drug it had proved efficacious when used intranasally.

This communication is in the main a summary of the work recorded by him in the *Archives of Internal Medicine* for April, 1922, together with notes of three cases of diabetes insipidus which he has since observed.

Chronic Diarrheas in Childhood.

TAYLOR, in the *Journal-Lancet* for February, 1923, states that treatment must be considered under three heads:

First, the child needs rational discipline and control. His environment should be healthy and happy. He is fortunate if his mother be both intelligent and nervously stable; otherwise he must temporarily be treated in a hospital.

Second, complicating or causative infections must be cared for. The opening of a chronic otitic abscess and the removal of infected adenoids have entirely relieved the indigestion in certain of his cases.

Third, the diet must be suited to the child's capacity.

In the milder cases avoidance of excessive carbohydrate may suffice. In more severe cases it is necessary to limit the diet to milk, milk curd, lean meat, egg-yolk, and orange juice. In the type known as celiac disease, in which there is always found gastric achlorhydria and defective biliary secretion, it is theoretically indicated and practically necessary to give some form of acid in order to stimulate the secretions of the digestive glands discharging into the upper bowel. He has accomplished this by using soured milk, lactic acid milk. This must be skimmed, as these patients tolerate only minimal amounts of fat. They usually digest milk protein well, and to each quart of the skimmed or sour milk is added the curd of from one to three quarts of skimmed milk. Their tolerance for carbohydrate is also much impaired. Taylor has had his best results when he has made his carbohydrate addition in the shape of blue label Karo corn syrup. Of this he has been

able to give an amount equal to from 5 to 7 per cent of the skimmed lactic acid milk. On this mixture then of skimmed lactic acid milk, added skimmed milk curd, and 5 to 7 per cent of Karo corn syrup, plus orange juice, he has had good results in every case, getting good gains in weight, increases in height, cessation of diarrhea, and, what is perhaps most remarkable of all, he has continued this feeding in certain cases for over a year without the development of anemia. The amounts given have varied with the age of the child, from 32 to 50 ounces per day. If the child's intestine has become distended and weak, the temporary use of an abdominal supporter and of liquid petrolatum are of definite service in guarding against retention of fecal accumulations. In the severe types of chronic intestinal indigestion, treatment is sometimes necessary for two or three years. Relapses are prone to occur after periods of apparent complete recovery.

The ameba histolytica must be borne in mind in all cases of enteritis. In certain cases it has produced incontinence as well as diarrhea. One may not find the ameba until he has examined specimens of mucopus obtained through the proctoscope. Emetine hydrochloride hypodermically is usually specific. He has been able to give dosages as high as ¼ gr. three times daily without producing abdominal pain or nausea. He has begun with small doses, 1/20 gr., and increased gradually. A colitis may persist for some months after the death of the ameba.

Lamblia intestinalis, a flagellate which makes its home high up in the intestine, is occasionally met with. It produces watery, squirty stools, usually fewer than six daily. Unfortunately, no drug has yet been found which will cause these parasites to disappear permanently. He has used thymol and methylene blue by mouth, getting relief of symptoms for several weeks; but the parasite always recurs. Arsphenamine injections have likewise been employed, with indifferent results, however. He has usually found this parasite present in other members of the family besides the patient. It apparently does not always produce symptoms.

In concluding his sketch of chronic diarrhea in childhood, he makes the following point relative to the diagnosis of chronic diarrhea in general: One must be on his guard not to confuse it with incontinence nor with fecal impaction and channeling.

Thymic Asthma.

THURSFIELD, in the *Archives of Pediatrics* for February, 1923, concludes that there is some reason, derived chiefly from the results of operative interference, to believe that Friedleben's dictum, "Es gibt kin Asthama Thymicum," is incorrect.

There is no reason to believe that thymic asthma is a common disorder; on the contrary, all evidence, clinical, pathological, and radiological, points to its excessive rarity.

Diagnosis of the condition is by no means easy; the most convincing syndrome is the coexistence of dyspnea with a protrusion of the manubrium sterni, abnormal dulness to percussion in this region, and a palpable and visible tumor during inspiration in the episternal notch.

Thymectomy is rarely indicated; *x*-ray therapy is preferable.

In the rare cases in which the diagnosis is reasonably certain, and relief is urgently required, thymectomy is an operation with good results and a fairly low mortality.

The Effect of Anesthetics on the Lungs.

In the *British Medical Journal* of January 13, 1923, MCDOWALL states that in the issue of this journal of November 11, 1922, there was published the report of the discussion at the annual meeting of the British Medical Association on bronchopulmonary complications following operations under anesthesia. He thinks it was a strange coincidence that the succeeding article was on the effect of anesthetic vapors on tissues, in which Flemming collected a very interesting series of experiments which showed

their detrimental effects on tissues and living organisms in general. In the first article stress was placed on the possible irritant effect of the vapors on the lungs; in the second no special emphasis was laid on the effect on the lung tissue.

It does not seem to be appreciated that the lung tissue may, apart from mere irritation, suffer serious damage as a result of actual contact with the vapor, apart from concentration in the blood.

Until quite recently knowledge of the function of the lung tissue was comparatively small, apart from the fact that the lungs were adapted for the supply of oxygen to the blood. The function of the bronchial muscles has been largely ignored and the physiology of the pulmonary circulation has been avoided, largely because of the experimental difficulty involved in its study and the negative results obtained by several well-known investigators. From book to book it had become quoted that the vasomotor mechanism in the lungs was negligible. Why there should be such an amount of muscular tissue in the lungs remained unexplained.

Much controversy centers round the action of adrenalin on the pulmonary circulation, as it is accepted that generally this drug acts only on tissues supplied by the sympathetic nervous system. While many observers have obtained negative or indefinite results, others, including Plummier, Starling, and Sharpey Schafer, have brought forward good evidence that adrenalin constricts the pulmonary vessels as it does the systemic. This suggests that the vessels have a sympathetic control, although in the light of more recent knowledge, referred to below, this has not been reinvestigated.

By the introduction in 1919 by Sharpey Schafer of a convenient method of recording the pressure in the pulmonary artery new light has been thrown on the pulmonary circulation, and amongst the findings has been the fact that the effect of drugs which act on the circulation was greatly modified by anesthetics.

He first noted that the effect of drugs on the pulmonary circulation would be much more easy to demonstrate on decerebrate animals, or animals under light ether anesthesia, than on those anesthetized with chloroform. For example, it was shown that the action of amyl nitrite on the pulmonary circulation can be prevented by deep anesthesia. An investigation is in progress to find out to what extent the functional activity of the lung tissue may be impaired by anesthesia. It has already been shown that the action of histamine, now acknowledged to be a pulmonary constrictor (Dale and Laidlaw, Morris), may be similarly abolished.

There is evidence, too, that the action of adrenalin on the pulmonary circulation may be prevented while the systemic effect may be unaffected. This has occurred where all possibility of backward pressure through an incompetent mitral valve and cardiac effects have been excluded.

When the literature of the subject is surveyed it is found that the most probable reason for the negative or variable results of different investigators, largely in the days when chloroform was in more common use, was the effect of the anesthetic. The effect of anesthetics is not necessarily excluded in lung perfusion experiments, as the animal is under an anesthetic immediately prior to death, and with the cessation of blood supply and anesthetic, the anesthetic has all the better chance to produce its bad effects. In the positive experiments of Sharpey Schafer and of Starling, referred to above, volatile anesthetics were not used except in the preliminary anesthetization, but chloral and chloralose respectively.

This is not the first time that attention has been drawn to the action of anesthetics on the lungs. In this journal, in 1880, McKendrick, Coats, and Newman described complete stoppage of the pulmonary circulation of the frog as the result of chloroform anesthesia, with actual destruction of the lung epithelium.

When the evidence put forward by Flemming is considered, the importance of the local effects of anesthetics on the lungs will be seen. He might also have added to

his list the fact that a piece of muscle exposed to chloroform vapor is killed with great rapidity, a fact which is made use of in the thermopile experiments of Hartree and Hill on heat production.

His results so far agree with those of Flemming on isolated tissues. Recovery from the pulmonary effects occurs after ether, but after deep and prolonged anesthesia with chloroform recovery is the exception. The actual death of tissue in the lungs as a result of the anesthetic does not appear to be a remote possibility—indeed, may be easily considered the natural sequel. It is outside the scope of this paper to study the evil results of such lethal action, but obviously the symptoms discussed at the Glasgow meeting might readily follow. That the absorption of toxic products from such dead tissue should produce delayed chloroform poisoning seems most reasonable.

Another function shown to be abolished is that of the bronchioles, which limit the amount of air passing in to the alveoli. Brodie and Dixon first demonstrated that the vagus no longer caused bronchiole constrictions under deep anesthesia. The muscles or their nerve supply were considered to be paralyzed by direct absorption of the anesthetic through the mucous membrane. He has demonstrated that the action of adrenalin on the bronchioles may similarly be prevented by deep anesthesia.

Now the abolition of the bronchiole function must necessarily throw a greater strain on the alveoli and cause them to be exposed to particles which otherwise would not reach them. Even if actual death of tissue does not occur, the mere loss of this protective mechanism temporarily must expose the lung to possible damage.

The investigation is proceeding, but from the results already obtained it is seen that the local effects of the common anesthetic cannot be ignored, not only from the purely experimental standpoint, but also from that of the clinician. Although anesthetics may be given to thousands of cases yearly without effect, it must be urged that we are still without an ideal anesthetic for general use.

From the evidence given it is seen that deep or prolonged anesthesia with ether, and especially with chloroform, should be avoided whenever possible. It is suggested that narcotics should be more extensively used to supplement volatile anesthetics.

How to Meet Obstetrical Emergencies.

GELLHORN, in the *Illinois Medical Journal* for January, 1923, states that in the treatment of eclampsia he finds the following to be of advantage:

As a preliminary, aspiration pneumonia should be prevented by lowering the head of the unconscious patient and from time to time wiping out mucus or vomited material.

If the stomach is distended, it should be washed out. Tongue and lips must be protected by a gag, a spoon around which a handkerchief has been wound, a clothespin, or the like.

This being done, the routine treatment is carried out by a number of successive steps:

Hypodermic injection of morphine gr. 1/6. Darken the room. Protect the patient from disturbing noises within or without the room.

Fifteen minutes later, when the morphine has taken effect, start a light ether narcosis. Do not use chloroform, as this anesthetic produces definite lesions in the liver, which has already been gravely affected by the eclampsia. During this ether narcosis, which is kept very light merely for the purpose of reducing all irritation to the central nervous system:

(*a*) Catheterize the bladder and examine the urine for albumin. If you have no facilities on hand, such as a test-tube, boil the urine in a large spoon and add a few drops of vinegar. (The exact amount of urine excreted in twenty-four hours and the microscopic examination for casts have no immediate importance, but they are most valuable in so far as they permit to a certain extent a prognosis.)

(*b*) Make an examination to determine the stage of labor. Make a rectal examina-

tion, if your gloves are not yet sterilized or the patient is not yet cleaned up. A vaginal examination made with the strictest antiseptic precautions, however, is preferable. If the dilatation is complete and the head low in the pelvis, deepen the narcosis and apply forceps; express the placenta by Credé's method, but refrain, if at all possible, from manually removing the placenta on account of the danger of infection.

If the child lies in transverse position, turn and extract it. If there is a breech presentation, pull down a leg and extract the fetus. Under no conditions, however, perform any of these operations unless the cervix is fully dilated.

While the patient is still under light ether narcosis, make a venesection of one pint—more would be inadvisable because the patient is going to lose some more blood during the delivery; less than a pint would be without value.

Institute the Stroganoff treatment, viz.:

(*a*) An enema of chloral hydrate, grains 30 in 10 ounces of milk, one hour after the first morphine injection.

(*b*) A second hypodermic injection of morphine, gr. 1/6, two hours later.

(*c*) Another enema of chloral hydrate, grains 30 in 10 ounces of milk, four hours later.

(*d*) An enema of 10 ounces of milk containing 15 grains of chloral hydrate in mild cases, and 30 grains in severe cases, six hours later.

(*e*) Repeat this enema after eight hours, if the patient still has convulsions. Even if the convulsions cease soon after the beginning of this treatment, continue the routine as outlined for ten or twelve hours. It is advisable to put the patient under a light ether narcosis while the enemas are given; at the same time the patient may be catheterized, an examination made, and the child delivered as soon as the os is found completely dilated.

(*f*) In serious cases with frequent attacks inject subcutaneously or intravenously one pint of sterile saline solution twice within the first twenty-four hours.

(*g*) The same mode of treatment is carried out if the convulsions first occur after delivery, with the modification that a venesection is made only if the loss of blood in confinement has been small.

If the treatment was successful and the patient delivered safely, give milk in large quantities for several days and later salt-free diet without any meat, eggs, or other proteins. When repeated urine examinations show absence of albumin, the patient may take a general diet.

The patient should not nurse her child for the first two days.

During the lying-in stage protect the patient against excitement, worry or strain of any kind; in particular, keep visitors out of the sick-room.

In very unfavorable cases with coma and little or no urinary excretion, rush the patient to a hospital and have both kidneys decapsulated as a last resort.

The plan outlined in the foregoing combines the advantages of the active and the conservative therapy. Expectant treatment is persisted in until conditions are favorable for delivery. Then, and only then, labor is rapidly terminated by methods which, with the precautions observed, can bring no harm to the mother. All irritation of the central nervous system is carefully kept away or reduced to a minimum, and every effort is made to relieve the poisoned organism of its toxicity. The whole plan is so simple that it requires no hospital facilities and can be carried out successfully by every practitioner.

Treatment of Toxemia of Severe Superficial Burns in Children.

ROBERTSON and BOYD, in the *American Journal of Diseases of Children* for February, 1923, state that from a purely clinical point of view there seems to be no doubt that the burned tissues are responsible for the production of some toxin which is taken up by the blood stream. The appearance of toxic symptoms after the first twenty-four hours probably indicates that the damaged tissue must be in contact with living tissue before a toxic substance can be manufactured.

The nature of this toxin is not definitely known, but from the clinical symptoms it would appear to be allied to the toxins produced in secondary wound shock and in intussusception. It differs from these toxins, however, in that it causes convulsions.

The treatment of these very severe cases of toxic shock in superficial burns in children offers a very definite problem. Every one admits, only to deplore, his helplessness when confronted with the case of a severely burned child in convulsions. In many of the cases the area of the burn would not constitute a surgical problem, but the toxic shock is likely to prove fatal.

In casting about for some means of relieving the toxemia, two methods of attacking the problem were considered: (*a*) local treatment of the burn; (*b*) treatment of the toxemia, once it is established.

(*a*) The possibility of removing the damaged tissue either by excision or scrubbing was considered but was found to be impracticable, since in most of the cases the area was too large, or it involved regions such as the face, or the patients were admitted in the toxic stage.

The only chemical application which seemed to possess any value in diminishing the toxemia or retarding its onset was sodium bicarbonate in saturated solution. In conjunction with the local application, the drug was given by mouth to the limit of tolerance. By this means the bicarbonate content of the blood was found to be increased. Though its administration serves to decrease the so-called acidosis which is present and in this respect is only symptomatic treatment, its effect seemed to be favorable.

(*b*) It seemed to them that the simplest and quickest way of overcoming the toxin in the blood was to remove it. They assumed that removal of a sufficient quantity of blood might give the patient a chance to overcome further accessions of toxin. The freshly injected adult blood, even if it did not affect the toxin directly, would at least supply fresh nourishment to the tissues and help to reëstablish a normal balance in the blood.

The assumption was not altogether theoretical, since they had had two burned patients who had convulsions and had recovered following straight blood transfusion.

To put into effect this idea, the operation of "exsanguination-transfusion" was devised. The object was to withdraw a very much greater quantity of the patient's blood than could be obtained by simple venesection and to replace this with fresh adult blood. Briefly stated, the operation consists in the initial withdrawal of blood from the patient's longitudinal sinus or femoral vein until the limit of safety is reached. The transfusion is then commenced in an elbow vien. Withdrawal of the patient's blood and injection of fresh blood are then carried on simultaneously until the amount withdrawn is slightly less than the amount available for transfusion. The withdrawal is then discontinued and the remainder of available blood injected. The amount of blood withdrawn has ranged from 200 cc in an infant up to 500 cc in a child of three years of age. It is obvious after the transfusion begins that a small but increasing percentage of the transfused blood is withdrawn. Notwithstanding this, the procedure in several cases appears to have turned the scales in favor of the patient. The technique is described in detail in a previous article.

The results so far have been very encouraging. In ten cases of burns of the type described (*i. e.*, with convulsions), two children received blood transfusion and eight were subjected to exsanguination-transfusion. Three of the latter died from burn toxemia. In the other seven cases the burn toxemia was relieved.

Under any method of treatment other than transfusion or exsanguination-transfusion, they have seen no burned patient recover after a convulsion has been precipitated as a result of the burn toxemia. In their opinion the operation of exsanguination-transfusion offers the better chance of recovery.

Conincident with the progress of the clinical work, experimental work was being carried out. Full details of these experi-

ments will be published later, but as the results furnish some substantiation for the theory on which the treatment described above is based, a brief summary of their results and conclusions may be of interest.

Their experiments show that there is a substance produced in burned tissues (in larger quantities in extensive skin burns than in those of other tissues) which circulates in the blood, either in or closely absorbed by the red blood cells, and which causes the symptoms of toxic shock, and in some cases death. The toxic material is produced in increasing amounts following the burning of the tissue until from twenty-four to thirty-six hours after the injury. It is produced only as a result of burning living tissues. The toxin is most highly concentrated in solutions of corpuscles suitably treated and least in the blood serum.

Chemically, this toxin consists of primary and secondary proteoses. Like snake venom, it is made up of two portions, a necrotoxic and a neurotoxic. The former is not destroyed by heat and is diffusible; the latter is thermolabile and colloidal.

They were unable to obtain any evidence of the production of antibodies against this poison. Katzeroff recently reported the finding of such antibodies. His evidence is based on the beneficial effects of convalescent serum from burned patients in fourteen cases of toxic shock and not on biologic tests.

The Toxic Effects of Tobacco Smoke.

BAUMBERGER, in the *Journal of Pharmacology and Experimental Therapeutics* for February, 1923, states that his analyses show that nicotine occurs in puffed smoke of cigarettes to the extent, on the average, of 0.57 per cent of the weight of the tobacco smoked. Cigarettes weigh about 1 gramme apiece, and about 80 per cent of the tobacco is smoked. The amount of nicotine in the puffed smoke would be for one cigarette about 0.0057 x 0.8 or 0.00456 gramme. At this rate, four cigarettes would be about equivalent to one cigar (of the mild sort used). The nicotine content of one puff from a cigarette was also calculated and is given in the last column of table 1 of his original article. Averaging his results, it seems that 0.025 gramme of a cigarette is burned at each puff, yielding 0.000137 gramme in one puff of cigarette smoke. The rate of puffing a cigar, cigarette, or pipe would therefore determine the nicotine dosage rate for the smoker. Just how much of the nicotine present is absorbed would also have to be known.

Lahmann gives a résumé of some experiments he performed on nicotine absorption from tobacco smoke. The smoke puffed automatically was first analyzed, and then similar smoke was drawn into the mouth and blown out again into the apparatus for analysis. The difference in nicotine content was called nicotine absorption. The results were also checked by analysis of saliva of the smoker. The first method gave for nicotine of cigar smoke 34 to 50 per cent absorption, and for cigarette smoke 20 to 37 per cent; the second method gave respectively 70 to 100 per cent and 35 to 42 per cent absorption. Through the electrical precipitation of tobacco smoke, described in another paper of this series, Baumberger has been able to show that 66.7 per cent of the smoke and presumably the nicotine drawn into the mouth (puffed) is absorbed, while if the smoke is inhaled 88.2 per cent is absorbed. As assuming an absorption of 88.2 per cent of the nicotine from the smoke inhaled (which is high, as expectoration must rid the body of a great deal of the nicotine) and a rate of inhalation of 5 per minute, the dosage rate of nicotine from a cigarette smoke would be at most (5 x 0.000137 x 0.88) 0.000603 gramme nicotine per minute, or 36 mgm. per hour. In puffing at the rate of five times per minute with an absorption of 67 per cent the maximum absorption would be (5 x 0.000137 x 0.67) 0.000459 gramme per minute, or 27.6 mgm. per hour. This maximum absorption is probably seldom reached, as the secretion of saliva is greatly increased during smoking, and the consequent expectoration probably eliminates

from the body a large part of the 67 per cent which had remained in the mouth, before it had been absorbed. Some smokers, however, do not expectorate during smoking. This matter will be discussed more fully in the paper on electrical precipitation of smoke.

Lahmann found that mature habitual smokers could not drink during one-half hour water containing more than 5 to 10 mgm. nicotine without severe symptoms. Non-smokers were affected by 5 mgm. nicotine taken at the same rate. Blythe quotes some experiments of Dvozak and Heinrich in which the author took 1 mgm. of nicotine without severe symptoms, but with 3 to 4 mgm. in forty minutes severe symptoms were obtained, some of which persisted for several days. According to Brundage, the fatal dose of nicotine is 500 mgm. taken at one time. It is generally believed that the habitual smoker acquires a partial tolerance for nicotine, but the amount of nicotine drawn into the mouth in one-half hour, if absorbed at the rate indicated by Lahmann, would account for the results of severe illness resulting from smoking by the novice. It would seem very likely that a large portion of the nicotine is dissolved in saliva and expectorated before absorption, as otherwise the tolerance necessary would be extremely high.

Dixon and Leek found some evidence of increased destruction of nicotine in the liver of repeatedly injected rabbits which would indicate an acquired nicotine tolerance. The extent to which nicotine poisoning might enter as an effect of habitual smoking would probably depend largely upon the degree of tolerance the subject could develop, the excess to which the habit is carried, and the degree to which inhalation and expectoration are practiced.

In the first paper of this series it is calculated that the CO content of the air in a room 3 by 3 by 3 meters in which ten men smoked for one hour with maximum CO production becomes 2.1 parts CO:10,000 parts air. This CO content is insufficient to account for the symptoms that non-smokers sometimes experience in such a situation. The maximum nicotine content of the air breathed by a non-smoker in such a room can be calculated as follows:

Number puffs per hour (300) x maximum nicotine per puff (0.000137) x number men (10) x per cent nicotine unabsorbed (0.32) = 0.132 gramme. This is equal to 5 x 10-9 grammes nicotine per cubic centimeter of air. Assuming a tidal air of 500 cc and 1200 breaths per hour, 3 mgm. nicotine per hour would be breathed, of which 88 per cent or 2.6 mgm. would be absorbed. In this example, however, it has been assumed that the nicotine all remains suspended in the air. This is certainly not the case, as the nicotine is in the form of droplets which soon settle out. The dosage that a non-smoker might obtain would therefore be much less than calculated above. However, it is possible that the nicotine absorbed is sufficient to account at least in large part for the headache that many non-smokers have as a result of attendance at a "smoker." It is probable that these headaches are due to increased intercranial blood-pressure resulting from the combined effects of nicotine and decreased oxygen supply, both of which would tend to raise the blood-pressure.

The total smoke absorbed may also be calculated on the basis of the data presented in another paper on electrical precipitation of tobacco smoke. Thus to take the same extremely crowded room and the maximum smoke production: Number puffs per hour (300) x maximum weight smoke (0.0059) x number men (10) x per cent smoke unabsorbed (0.32) = 5.664. This is equal to 21 x 10-8 grammes smoke per cubic centimeter air. Assuming a tidal air of 500 and 1200 breaths per hour, 126 mgm. smoke per hour would be breathed, of which 88 per cent of 111 mgm. would be absorbed. What physiological effect the smoke may have is not known.

Baumberger concludes that the average nicotine content of the smoke in per cent weight of tobacco is 0.573 per cent for cigarettes.

Of the nicotine in the tobacco about 14 to 33 per cent appears in the smoke puffed.

The maximum amount of nicotine retained in the body is calculated as 36 mgm. per hour in inhaling and 27.5 mgm. per hour in puffing. This dose of nicotine would require a high tolerance on the part of the subject in order to escape disagreeable symptoms, and would account for the illness of the novice as a result of smoking. It is undoubtedly true that in most cases, a large per cent of this nicotine is expectorated before being absorbed, therefore the usual dose of nicotine may be very much less than the amount calculated above.

Baumberger, in the same issue of the *Journal of Pharmacology and Experimental Therapeutics,* also states in his conclusions that the amount of CO produced in smoking is increased by strong suction.

Cigarettes yield an average of 8.3 cc CO per gramme tobacco smoked, *i. e.,* 0.97 per cent CO by weight.

In inhaling tobacco smoke about 61 per cent of the CO is absorbed.

Theoretically a maximum saturation with CO of 22 per cent of the hemoglobin of a smoker may occur. This degree of saturation cannot be withstood over an hour without disagreeable symptoms.

It is extremely unlikely that the CO of tobacco smoke is injurious to any but the most inveterate inhalers.

Mechanical Treatment of Severe Dropsy.

The *Lancet* of February 17, 1923, in its "Correspondence" columns published the following communication from Rao, of Madras, on this subject:

Having realized the risks that patients run of getting Southey's tubes introduced into their tissues or long incisions made, he hit upon the simple plan of puncturing with a straight surgical needle, and has had resort to the procedure on many an occasion. He has made punctures in subjects suffering from various diseases, such as heart disease, acute nephritis, deficiency edema due to extreme secondary anemia, etc. In fact, it is obvious that the method can be resorted to in all cases in which indications for drainage of fluid from tissues exist. Of course, the usual measures should always be given a fair trial, and when swelling does not decrease in a reasonable period of time punctures should be made. The danger of allowing dropsical accumulations to go on increasing must be evident to all clinicians, and failure to produce any impression on such accumulations by the usual therapeutic measures is, he believes, within the experience of most. Under such circumstances it is clear we should have resort to some mechanical measures.

The technique described by Dr. Carr is exactly what he also follows except in one minor particular. He makes punctures only over the feet, but it has been his practice not to limit these to the feet only, but also puncture the legs, the thighs, the scrotum in men, and even the lateral aspects of the abdominal wall. These regions are also edematous in most cases, and punctures over them help to drain the fluid quicker. There is certainly no element of risk in including other regions in the operation than only the feet. The amount of fluid that drains away is sometimes enormous, and in one case of cardiac failure due to mitral stenosis, which was under his care during July, 1921, as much as 20 pints could actually be collected and measured! We may take it that at least half this quantity soaked through the dressing, etc., and could not be collected. What strikes him as a most noteworthy feature about this therapeutic measure is the rapidity with which patients improve once fluid begins to drain away. From a hopelessly waterlogged condition and a state of alarmingly increasinging dyspnea, the patient is brought into a state of comparative comfort and safety within such a short time as twenty-four to forty-eight hours, and even after the course to relief and sometimes to cure is smooth and uninterrupted. Not only do drugs begin to act as noted by Carr, but the kidneys, which up to the time of punctures absolutely refused to eliminate fluid, begin to excrete enormous quantities of urine day after day until the whole anasarca disappears.

The Treatment of Aural Discharge in Children.

BARWELL, in the *Lancet* of February 17, 1923, in its columns on "Modern Technique in Treatment," states that the principles that should guide us in the treatment of acute suppurative otitis are due to combat those factors which make for chronicity. As soon as a child complains of earache, the meatus should be cleared of wax and débris, if necessary by gentle syringing with warm 1-in-60 carbolic lotion, and antiseptic drops instilled every four hours; for this purpose the best drops are carbolic acid 25 gr., glycerin 1 ounce, for they possess not only an antiseptic but a decidedly sedative action. The meatus should be filled with this solution, previously warmed, and the affected ear kept uppermost for three minutes; dry heat should then be applied to the side of the head in the form of a rubber hot-water bottle over a large pad of cotton-wool. Incision of the drum is a most valuable measure, which should always be performed early rather than late; it promptly relieves pain and stops the further progress of the disease.

The drum should be incised as soon as it is found to be bulging or to present a bright velvety-red appearance, or even when severe earache and fever persist in spite of treatment for twenty-four hours without improvement. This little operation is quite easy, and is within the power of every practitioner, and it is practically impossible to do harm; a general anesthetic is most advisable, but gas is sufficient as the mask need not be removed. Afterwards a narrow drain of gauze should be inserted into the meatus and a large pad of wool applied; the latter is changed when wet with the often profuse discharge; while the gauze is changed daily by the doctor; if such personal attention is impossible, the gauze drain may be removed after twenty-four hours and the carbolic and glycerin drops used. The discharge is at first serous or purulent, but later becomes mucoid; it should be wiped away with aseptic precautions, but syringing conduces to secondary infection and is inadvisable. The pain should cease in a few hours after free discharge has been established, and the temperature should become normal within two days; if these two symptoms persist without improvement for more than three days, and especially if mastoid tenderness be present or if discharge has ceased, the antrum and mastoid cells must be opened without further delay, unless the perforation has closed, when paracentesis should be repeated. The treatment is the same if the case has not been seen until after rupture of the drum; but owing to the risk of secondary infection from the meatus, the longer the discharge has lasted before treatment, the more likely is it to become chronic. When a child first comes under attention with discharge a week old, with pain, fever, and mastoid tenderness, hot fomentations and three-hourly syringing with hot 1-in-60 carbolic lotion will often bring about a cure.

Two points about acute otitis in young children deserve mention; symptoms pointing to the onset of meningitis may be present, fever to 105° F., rapid pulse, delirium, retraction of the head, and strabismus, but such symptoms may quickly disappear after the drum has perforated. Again, in infants especially, but also in children up to the age of three, there are often no localizing symptoms at all; therefore the ears should be examined in every case of unexplained pyrexia in small children. After spontaneous or surgical opening of the drum the discharge is usually profuse, and may not reach its maximum until the second or third day; after a day or two more it normally then diminishes, and ceases with healing of the drum in two to three weeks. If it continue in greatly diminished quantity and with absence of other symptoms for a maximum of six weeks, it need not give rise to anxiety. But if, at the end of two and a half or three weeks from the onset, free suppuration persists and shows no sign of diminution, even though all other symptoms such as pyrexia, pain, or tenderness have disappeared, it is far wiser to open the antrum and mastoid cells. This operation, the simple antrotomy or

Schwartze operation, does not damage the tympanum, on the contrary it may be relied on to produce immediate cessation of discharge with a healthy drum and normal hearing; whereas, if left alone, such a case will almost inevitably remain with a permanent perforation and damaged hearing. The antrotomy wound may be stitched up, with or without a small drain, at the conclusion of the operation, and heals at once. He has been astonished, when operating on such cases, at the quantity of pus found in the mastoid cells.

If the child is brought for treatment when the aural discharge is already chronic a cure is, of course, far more uncertain; but even here most cases tend to get well if carefully treated, though a permanent perforation often remains, and in such cases discharge frequently recurs. The treatment is on similar lines to those of acute suppuration; careful mopping out of discharge followed by antiseptic drops. It is better to avoid syringing, though this is less dangerous than in acute cases; but it must sometimes be employed when the discharge is very profuse and when the mother cannot be trusted to mop out the meatus properly; he prefers a warm 1:60 carbolic lotion. But even in hospital work most parents can be taught to mop out the ear in a cleanly fashion with cotton-wool on a holder or a matchstick. The most valuable drops in chronic cases consist of boric acid 15 gr., rectified spirts ℥j; they are sometimes painful at first and may be ordered diluted to half this strength for the early weeks of treatment. Considerable patience is needed and is often rewarded, for he has known ears to heal after two years' continuous treatment. Above all things it is necessary that no water from washing or bathing be allowed to get into the ear; it always makes these cases worse and often starts discharge from a dry quiescent perforation. Small granulations should be touched with a strong solution of nitrate of silver or with trichloracetic acid dusted on a probe; larger granulations or polypi must be removed surgically. Rapid recurrence of polypi is an indication for the radical mastoid operation, as also are recurring attacks of earache. Barwell does not propose to discuss at length the indications for operation in chronic otorrhea, but it may be said that operation is not called for, at any rate in children, merely by persistent discharge, unless it remain very foul or profuse, and better results are obtained by postponing the radical mastoid operation, when possible, until the child has at least reached his teens.

Unhealthy conditions of the upper air-passages have a most definite influence on otitis media; in children this usually means adenoids and chronic tonsillitis. Adenoids and tonsils should not be removed in the acute stage while there is fever and pain; but when these have subsided and discharge persists to the end of the second week, the removal of a pad of adenoids may cure the otitis and save an operation on the mastoid. All cases of chronic otorrhea should be examined for adenoids, and these, even if only small, must be removed together with unhealthy tonsils; it is remarkable how often the ear will heal after this operation.

The Treatment of Malignant Disease by X-rays.

In the *Lancet* of February 24, 1923, WEBSTER states that from the combined surgical and radiological point of view Schmieden has recently published a most valuable paper on the indications for surgical and *x*-ray treatment of malignant tumors. Schmieden and his *x*-ray assistant Holfelder have summarized conclusions which represent what may be called cautious progressive present-day opinion:

1. With few exceptions every operable carcinoma should be operated on, with prophylactic postoperative radiation in addition.

2. In addition to postoperative radiation, a single intensive radiation before operation is coming to be considered important.

3. Practically all inoperable carcinomata and all inoperable recurrences should be radiated. This gives in many cases clinical

cure, in others it results in operability, often less bleeding, irritation, and pain, as well as limitation of further metastasis.

4. Facial carcinomata, even when operable, can well be treated exclusively by radiation for cosmetic reasons.

5. Sarcomata, as a rule, should only be radiated, certainly in all cases in which operation would cause considerable bodily mutilation. (Any increase in size of the tumor after an efficient radiation should not be considered proof of failure to respond; it is usually only temporary.) Schmieden here gives five essential technical requirements.

11. In the treatment of malignant tumors, along the whole line, *x*-ray work has become superior to radium treatment.

12. The time has not come when comparative statistics can show the value of operation or radiation.

Werner in a useful summary says that as yet ray therapy only in a proportion of malignant tumors can be compared with surgery in its results. But in carcinoma of the skin, lip, inner cheek, soft palate, upper larynx, thyroid, vulva, vagina, uterus, tumors of the hypophysis and mediastinum, and sarcomata, which often react promptly, radiation may be preferred. All operable new growths not in this series are better operated on than radiated, if one or other procedure must be chosen.

Radiation treatment is in rapid process of evolution and there are at least six possible lines of advance:

1. In the engineering and electrical workshop, improvement of apparatus in power and reliability.

2. In the physical laboratory much remains to be done with measurements of dosage, standardization, calculation of scattered radiation and absorption in animal tissues (this is specially necessary for radium dosage, as Guilleminot and others have noted); the physical side of biological radiation effects—for example, ionization and osmotic changes in cells and fluids—requires much research.

3. In the post-mortem room and the pathological laboratory, more statistical and experimental work; apart from immunity and gross animal tumor work, the histological tissue reactions to radiation, as Ewing says, seem to require the combined genius of a Waldeyer, a Weigert, and a Virchow to elucidate them; here new methods like vital staining may be of use; and there is a very wide range for biochemical investigation as to the radiation effects on basal metabolism, etc., as to the rôle of the cell-lipoids and cell-decay products, etc.

4. Clinical technique is a most important branch requiring much further working out—for example, anatomical technique of radiation applications to different sites of the body on such lines as Holfelder's in Schmieden's clinic by sectional scaled sheets and models and graphical representation of radiation fields. For the last year he has used scaled drawings in almost every case, and regards this as essential. Auxiliary techniques such as diathermy, ionization, radiation stimulation dosage, or general minimal repeated radiation or other means for stimulating the patient's immunity require much further research.

5. In relation to surgery enough has already been said as to the necessity and value of team-work, and the best results have been shown so far in several important spheres to have been the result of close coöperation between surgeon and radiologist. Much still has to be learned as to the value of pre- or post-operative radiation, or both, and when the raying should be given in relation to the operation, and in what types and sites of lesion one or other or a combined method is best for the patient.

6. Finally, auxiliary medical measures require much further investigation; though about 100 substances have already been tried, still in this sphere, some day, may be discovered what may displace both surgery and radiation in the treatment of malignant disease. At present the general management of the cancer patient is too often neglected; open air, exercise, diet are not unimportant in recovery, and the rôle of hematinics, colloid, protein, and animal extract injections or transfusion, and of

drugs such as arsenic, iodide, etc., is little understood yet.

From the clinical as from the pathological standpoint there is no doubt, as Ewing has said, that "radiation therapy has introduced a new era in the study of cancer." He has emphasized the experimental evidence recently accumulated as to the artificial immunity against cancer produced by the absorption in the body of radiated tumor tissue. Whatever the ultimate value of radiation treatment may be, alone or as a combined method, from the point of view of immunity, and from the fact that in its mode of action radiation "calls on nature's forces to accomplish the cure," we must hold with Ewing that "the curative action of Roentgen ray and radium . . . is the first rational therapy of cancer ever devised."

Surgical and Genito-Urinary Therapeutics

Intracranial Trauma.

FRAZIER *(Surgery, Gynecology and Obstetrics,* January, 1923) thus wisely discusses this important subject:

Fracture of the skull and the concomitant injury of the brain were favorite subjects of discussion long before the era of modern surgery, and yet there are certain aspects about which differences of opinion and differences of practice persist. The mortality, high as it now is, has been reduced by the elimination, to a large extent, of meningitis as a complication. The immediate and proper management of the scalp wound in compound fracture of the vault and the hygiene of the nasopharynx and the external auditory meatus in basal fractures has reduced measurably the incidence of meningitis. Urotropin is always prescribed with childlike faith, but if it be true that the drug is effective only in an acid medium, it must be inert in the cerebrospinal fluid.

Putting aside the question of infection, there remain two factors which are responsible for the majority of fatal cases: hemorrhage from the middle meningeal artery and cerebral contusion. The clinical picture of hemorrhage of the middle meningeal artery has so many distinctive features that one might forecast its recognition and appropriate treatment with but few exceptions. And yet in an analysis by Le Count and Apfelbach of a series of cases in the Cook County Hospital, hemorrhage from the middle meningeal artery was unrecognized as a cause of death in a not inconsiderable number of instances. These statistics are quoted as a warning to correct the prevailing impression that the symptoms of middle meningeal hemorrhage always conform to the classical description and are therefore easy of interpretation.

Cerebral contusion and laceration, with or without basal fracture, present the most difficult problem from the standpoint of treatment, and they are the most frequent cause of the fatalities of intracranial trauma. The outstanding feature in the pathology of contusion and laceration is the cerebral edema, more or less widely diffused according to the violence of the injury, and the concomitant increase in intracranial pressure. Because of the latter, and since the introduction of the operation, subtemporal decompression, resort to this operation, more or less indiscriminately, has become an all too prevailing practice. This statement invites the question, how shall one discriminate?

Let us assume without argument that there is no justification for the immediate resort to decompression—that is, immediately or shortly after the injury. A cerebral

trauma, so grave that without intervention death follows within the first 6, 12, 18, or even 24 hours, will not be influenced by a subtemporal decompression. In these cases there may be a grave cerebral anemia due to the rapid increase in intracranial pressure, but the desperate situation is created by a lesion within the medulla itself. It may be an extension of the rapidly diffusing edema, or an actual intramedullary contusion or hemorrhage, gross or microscopic. Whatever the pathology, the lesion is within the brain stem and cannot be influenced by a subtemporal decompression. Hence the futility of the operation under these circumstances. May we not assume, too, without argument, that a subtemporal decompression is without justification in cases of so moderate a degree of trauma that the recovery of the patient is at no time in serious doubt? It has been claimed that subtemporal decompression in these cases assures a more prompt recovery from the immediate effects and reduces the incidence of the late effects of intracranial trauma. This is, however, a mere assumption; there is up to the present time no substantial evidence in support of it.

Having eliminated the very grave and the milder cases, there remains an intermediate class, and it is in this class that the operation in question may be performed with propriety. Even in this intermediate class one should discriminate. Operation is appropriate only in selected cases. How shall this selection be made? The decision must be made usually in the second twenty-four hours after the injury, not before and seldom later, and the decision must be based upon evidence of increasing pressure. Too much stress must not be laid upon single observations. We hear too much about the increase of intracranial pressure, as measured by the lumbar puncture manometer, about increase in blood-pressure, about papilloedema, as indications for operative intervention. The blood-pressure and papilloedema are not infallible signs. The evidence should include a complete survey of the cerebral functions disturbed; stupor or unconsciousness, muscular relaxation, reflex disturbance, Cheyne-Stokes phenomena, and as supplementary evidence only the blood-pressure papilloedema, etc. As the cerebral anemia becomes more intense, the disturbance of cerebral function becomes more pronounced, and one soon learns to evaluate the degree of cerebral anemia in terms of disturbed function. Admittedly, the selection of the time for operation requires an intelligent grasp of the pathology, the physiology, and the clinical evidence of brain trauma, plus the exercise of judgment on the part of the surgeon. But after all, are not these the requisites for success in all fields of surgery? Rules of thumb are poor props on which to build a reputation.

Even in properly selected cases, subtemporal decompression will not tide the patient over the crisis always. As a matter of fact, subtemporal decompression is most effective in those cases in which there is an excess of cerebrospinal fluid in the subarachnoid and subdural space; and the opening of the dura releases the tension by allowing the escape of fluid. *Per contra*, the operation is least effective when there is no free fluid and the herniated brain engages snugly in the dural opening.

The First and Last Kink.

ARBUTHNOT LANE *(The Practitioner*, January, 1923) in his characteristic vivid phraseology, as indicated by the title of his article, states that when the general practitioner has acquired enough skill and experience to feel sufficiently confident to perform any operation on the interior of the abdomen, the one he describes is one with which this operator should be perfectly familiar. The first and last kink is by far the most important of all the acquired or evolutionary bands developing in the abdomen in consequence of the abnormal accumulation, and the delay in the passage, of the intestinal contents. It is essentially a product of civilization and is responsible for very many of the troubles which con-

stitute the price we pay for the advantages it affords to the community.

Delay of the contents of the large bowel produces a great variety of results, the variation depending very largely on the vitality of the individual. In one extreme, when the subject is feeble and more frequently a female than a male, the colon simply elongates and dilates from below upwards, nature making no attempt to prevent these changes the causes of which are obviously simply mechanical. In consequence of this elongation and distention of the colon, the several portions of the large intestine drop and produce a condition to which the term visceroptosis has been generally applied. This dropping does little harm except in the case of the cecum, in which, when prolapsed and dilated, Jordan has shown by means of radiograms taken at various angles, torsion and obstruction of the terminal ileum may ensue.

The elongation and dilatation of the pelvic colon affords, however, a most serious obstacle to the passage of fecal matter through it, since the loose elongated dilated loop of bowel puddles in the floor of the pelvis, and renders the transit of solid material through it very difficult and sometimes almost impossible. It is to meet this condition that intestinal lavage, commonly described as Plombière treatment, is adopted, since it is the only possible means by which solid matter can be evacuated in advanced cases. This type is illustrated. In the more vigorous subject the same mechanical factor, namely, constipation, is met in quite a different manner, since the tissues of the individual react vigorously. At every point of stress acquired membranes are formed in the mesentery, tending to retain the bowel in position in its normal relationship to the abdominal wall and to prevent its elongation, dilatation, and prolapse.

In describing the changes which the skeleton of the laborer undergoes in consequence of occupation, the author demonstrated that any alteration or variation which developed to enable the individual to accommodate himself more readily to his surroundings, or, in other words, to perform his laborious duties as economically as possible, tended to diminish his vitality and to shorten his life. The development of the acquired peritoneal bands, which are at first helpful, is no exception to this rule, while the results are even more disastrous than in the case of the laborer. As they become stronger and as they fix the bowel more and more firmly to the abdominal wall, so they reduce the lumen of the intestine at their points of attachment and so obstruct the passage of material through them. The constant impact of fecal matter, as it is forced through the constricted bowel, produces in the first instance inflammatory changes which later readily take on a malignant character.

In no part of the intestine is this change so pronounced as in the first and last kink, which may be regarded as the prime factor in the causation of disease in the several portions of the gastrointestinal tract, the associated autointoxication causing all the tissues of the body to undergo degenerative change. Unfortunately, as time goes on, these bands control the effluent at their points of attachment and produce obstruction. The kink affects the large bowel as it passes over the brim of the pelvis, at the junction of the iliac and pelvic colon. It is in consequence of the obstruction, which is produced by the fixation of the large bowel at this point, that the difficulty in evacuating the proximal bowel results in the formation of similar bands along its convexity and at the end of the ileum, together with the changes in the small intestine, duodenum, and stomach, consequent on their obstruction.

The second type lends itself most readily to surgical interference, since by freeing the colon in the situation of the first and last kink all the consequences of the obstruction, which existed there, are relieved at once and to a degree varying

inversely with the stage of their development. In any case it is obvious that whatever has to be done to the changes in the gastrointestinal tract, which have developed in consequence of the obstruction at the first and last kink, this, which is the cause of all the other troubles, should be dealt with efficiently at the same time.

One point of great importance in the development of the membrane which produces this kink is that the acquired band or bands which produce it very frequently grip the left ovary and Fallopian tube and may later surround the ovary in a complete sheath; this not only interferes with the functions of these structures, but it also produces cystic changes in the ovary. As the ovary is fastened very intimately and immovably to the bowel, where it is anchored, obstructed, and inflamed, it is obvious that all the symptoms which are produced, both intestinal and ovarian, are exaggerated about the menstrual periods, and that the woman experiences great local ovarian pain as well as intestinal discomfort in this situation and in the proximal bowel, especially when constipated. The left spermatic vein frequently becomes involved in the cicatrizing band causing varicocele.

Clinically, the presence of the kink is readily recognized. Pressure on the iliac fossa above or below the anchored bowel is quite painless, but the moment it is exerted on the fixed and inflamed area of bowel the patient suffers great pain, which varies with the amount of pressure exerted and the degree of inflammation of the colon at the seat of constriction.

Ovarian pain is also readily elicited by pressure on the abdomen over the fixed ovary or by bimanual examination.

The iliac colon can usually be readily felt by the finger, and the seat of obstruction can be clearly defined. If there is much flatulence, or if the abdominal structures are loaded with fat, a free purge renders the examination more easy and certain. A bismuth meal followed by a bismuth enema will afford naked-eye evidence of the condition, if the examination is made by a radiologist who is expert at this work. The author has known radiological reports do more harm than good from want of experience on the part of the operator. In his experience, good screen work is very rarely met with; radiograms alone are frequently misleading.

If the surgeon has rendered himself thoroughly familiar with the details of the structure and arrangement of the acquired bands, which anchor and obstruct the bowel at this point and which may also secure the ovary, the measures to be adopted are perfectly simple. That this knowledge is not general is shown by the casual way surgeons talk about "mobilizing the colon." In doing this they tear roughly through the acquired membranes, and so, to some extent, they restore the mesentery to its original length. The membrane must be accurately defined and then carefully dissected off or separated by firm pressure from the bowel and from the mesentery to which it is attached, the greatest care being taken not to leave the surface to which the membrane was attached bare of its peritoneal covering. When the mesentery has been restored to its normal length and the lumen of the bowel completely freed from any controlling or constricting influence, the surgeon must go carefully over the surface of bowel and mesentery from which the membrane has been removed, and if he finds any portion of the area freed from its peritoneal covering, he must cover it over perfectly, no place being left bare of a serous covering. In this way adhesions are avoided, and recurrence of the formation of bands averted. Such recurrence of this development can occur only if the factors which originally determined their formation are allowed to continue in action, but this can be readily avoided by the proper free use of paraffin.

A long median incision should be employed, for a thoroughly free exposure of the parts must be obtained. It is impossible to carry out the necessary operative details with anything approaching accuracy through a small incision. After all the details of this most important operation have

been attended to, the rest of the abdomen can be thoroughly investigated, and any result which was consequent on the presence of the obstruction at the first and last kink dealt with.

Diminution of Postoperative Shock by Preoperative Desensitization.

De Courcy (*American Journal of Surgery,* December, 1922), led thereto by the experiments of Cannon and Dale and Bugliss, who found that destruction of muscle tissue causes a fall in the blood-pressure when the nerve supply to the injured part is blocked, and demonstrated that this fall is due to absorption of muscle toxins liberated by the pulpefication of tissue, has proposed as one of the factors in lessening postoperative shock the injection of specific proteins. He expresses the belief that by desensitizing patients to these proteins before operation the surgeon may overcome, or reduce, the reaction following operation to a minimum which would make convalescence easier, would obviate gas pains and prevent in a large measure if not entirely secondary postoperative shock. He further states that in hyperthyroidism and hypertoxicosis it will displace ligation in a large number of cases, and give us a safer type of ligation in the very severe type of cases in which we hesitate to perform this operation.

Non-specific protein immunization, as a principle, is not new. It has been used with satisfaction in such diseases as gonorrheal arthritis, influenza, pneumonia, puerperal sepsis, typhoid fever, etc., and it accounts for several cures of cancer with serum treatment reported in the literature. Up to the time (1916) that Schmidt and Saxl introduced intramuscular injections of milk, however, non-specific therapy was considered dangerous; at this time typhoid vaccine was generally used. The work of Schmidt and Saxl was quickly followed by that of Bruch, Muller, and Weiss, who began using 5 to 10 cc of sterile, toxin-free milk intragluteally. They showed that this treatment is rarely followed by a chill, although one may occur, but it is followed in six to eight hours by a typical rise of temperature which subsides in twenty-four hours. By this method there is relatively little danger of anaphylactic shock. Morguzzi in 1920 used this method in 19 cases, and it proved satisfactory in every instance. He claims that, while the non-specific method is not a substitute for the specific, both should be used.

This form of therapy, of course, has not been adequately explained. Probably the most widely accepted theory is the stimulation of the immunizing power of the bone-marrow, as evidenced by the formation of new granular neutrophile leucocytes. Other theoretical explanations are the stimulation of non-specific ferments of the serum, leucocytosis, and an increase of red blood-corpuscles. The curative and prophylactic results obtained, however, are so striking as to argue against the above theories, and more for some specific reaction within the body.

Assuming that the rise of temperature and the quickening of the pulse following surgical procedures are due to destruction of tissue at the time of operation, and the absorption of protein material, the author has attempted to desensitize every patient before operation by injecting non-specific proteins intragluteally. In the early series he used typhoid vaccines, but, because of the severity of the reactions, he began using toxin-free milk (5 cc, increasing to 15 cc). Injections are made every five to seven days, depending upon the reaction, and continued until there is no resultant leucocytosis. Usually two or three injections are sufficient. A leucocyte count and a blood-sugar test are made twelve hours following injection in order to discern any reaction that may not have caused a rise of temperature or a quickening of the pulse.

The number of cases studied to date is 100, including 25 of hyperthyroidism. Three hundred and twenty-five injections

were used in the one hundred cases. One hundred and thirty injections gave typical reactions with the corresponding rise of temperature and pulse; one hundred and seventy gave a relative leucocytosis varying between 11,000 and 13,000 with a slight increase in blood sugar; while 25 gave no (discernible) reaction at all. In forty-eight cases studied postoperatively (all major operations) there was no reaction, that is, there was no rise of temperature or increase in pulse (over 80) throughout the entire convalescence. In twenty the reaction was negligible, temperature not exceeding 100° and pulse not exceeding 90; while in seven the reaction was the equivalent to a case without previous injections. The remaining twenty-five cases were of hyperthyroidism.

Vulvovaginitis.

STEIN *(Surgery, Gynecology and Obtetrics,* January, 1923) quotes Abt to the effect that 70 to 80 per cent of children with vulvovaginitis had gonorrheal infection. Indirect contact, he stated, was the mode of transmission, and that "bad technique" was responsible for 98 per cent of the cases. By this he meant common sleeping quarters, toilet seats, bath tubs, public baths, swimming pools, wash cloths, underclothing, etc. Occasionally direct contact, as in case of sexual violence, is the mode of infection. Institutions were emphasized by Abt as an especially potent factor, there being rapid spread of the infection after the admission of an infected case.

Norris and Mickelberg are of the opinion that clinical evidence is of greater diagnostic value than the stain method, for, in the chronic stage of gonorrhea, the discharge is scant, gonococci few, and may be atypical morphologically and tinctorially. They warn that other cocci may be present which may confuse one; and that some strains of gonococci are more susceptible to certain stains than others, and that there may be errors in the performance of Gram's stain. A diagnosis made by the staining method is of no value except when made by one skilled in this work, and negative results have no significance unless frequently repeated. They advise obtaining smears from centrifuged washings of the vagina, using a soft-rubber eye syringe. Kolmer advocates cotton swabs wet in weak bichloride solution moved about in the vagina and then rolled, but not rubbed, over the slide.

Rubin, after studying 255 cases in the Mt. Sinai Dispensary in New York, concludes that too much value is placed on the smear examination. He believes that the diagnosis rests upon cultural and serologic tests. Provocative silver injections have been recommended by many as an aid in obtaining positive smears.

Of the many methods of active treatment described in the literature, a few will reveal the diversity of opinion.

Gellhorn in 1920 described the method used in treating vulvovaginitis in the City Hospital, St. Louis, Missouri, consisting of daily injections into the vagina of a one per cent silver nitrate in an ointment of equal parts of lanolin and white vaselin. Discharge and excoriations disappeared rapidly under this treatment, and the average duration of treatment was three to four weeks. The treatment is simple and can be trusted to nurses or mothers under supervision. With this method the number of weeks in which children are evacuated is less than the number of months formerly required.

Reports of the effect of raising the body temperature in gonorrheal patients have arrived recently from abroad. Following the publication of Weiss, who reported the favorable effect of prolonged hot baths upon fifteen soldiers with acute gonorrhea, Engwer treated a three-year-old girl suffering from gonorrhea of the vulva and anus with a bath at 42° to 44° C. for one-half hour. Two days later the child was cured and she remained so. Ylppo and Bendix each reported a case of vulvovaginitis cured with daily prolonged hot

baths. Risseoloda, Scholtz, Nast and Schulz had less favorable results and finally gave up the method. Schulz reported instances of delirium, fainting and cramps following the hot baths. Of 20 cases treated, no cures were obtained. The children complained of severe headaches and restlessness; they became weak and drowsy. Schulz warns against the use of thermal baths for children.

Lode used thermal baths also in seven cases without cure, and concluded that the danger to the child is out of all proportion to the benefit gained.

All suspicious and positive cases were treated with daily injections into the vagina of an ointment composed of one per cent mercurochrome-220 in equal parts of lanolin and vaselin. (Gellhorn's method, substituting mercurochrome for silver nitrate.)

Smears and cultures were taken at beginning of the treatment, again after two weeks of treatment with one day of rest, and at weekly intervals until three successive negatives were obtained, a week apart. Treatment was then suspended, smears and cultures being taken again in two weeks, and if negative finally, in three or four weeks, to determine cure. No other treatment was permitted except that a daily tub bath was prescribed.

The article concludes as follows: Vulvovaginitis is an infection which frequently is gonorrheal in origin, but may, even in purulent varieties, be non-specific. Filth, unquestionably, plays a part in predisposing to the infection and may be the chief cause in the milder types.

Diagnosis rests upon clinical evidence of the disease and smear examination made by an expert. Cultures prove positive in about 50 per cent of gonorrheal cases and are therefore not requisite for diagnosis.

Purulent vulvovaginitis should be vigorously treated by an approved method, such as that suggested by Gellhorn. A daily tub bath is an aid to local treatment, and in mild non-gonorrheal cases is all that is required for cure.

Determination of cure rests upon the disappearance of clinical evidence of the infection, three negative smears at intervals of one week after suspending treatment, and a period of observation equal in time to the duration of the treatment.

Blood Transfusion in Postoperative Conditions.

HAYS (*American Journal of Surgery*, December, 1922) states that irregularities in temperature have occurred so often in postoperative mastoid cases that one is on the lookout for them in almost all cases. In many such cases the wounds look clean; in some of them the mastoid wounds have healed, almost by primary intention, while the pyrexia was still going on.

How can one account for such temperatures? Suspicion is of course directed toward the sigmoid sinus. This suspicion is justified in cases in which the sinus was exposed at the operation, but in many cases not only was the sinus not exposed but it was found to be covered with a hard, healthy plate of bone that showed no evidence of infection.

In many of these postoperative cases the temperature may be due to some protein invasion of the blood, as pointed out by George Cott of Buffalo a number of years ago, or it may be due to some invasion of the blood stream, which invasion is overcome by the strong bactericidal character of the blood itself.

The author gives some cases sufficient to illustrate the value of blood transfusion in postoperative mastoid cases in which there is an irregular intermittent temperature which cannot be definitely accounted for.

Apparently the blood has certain bactericidal properties, and when the resistance is good it is able to take care of infection; but when the resistance is lowered it is unable to cope with the situation and some outside aid must be sought. The transfused blood not only gives new life to the patient, increasing resistance, but by its bactericidal property it is able to overcome the infection present.

Antiseptics in Common Operations.

Dixon *(The Practitioner,* January, 1923) in a preliminary discussion of the matter notes that the cells of bacteria, like other cells, are composed of colloids, principally proteins and lipoids, in a state of hydration, which resemble fats in their solubilities. This colloidal mass, with ferments, water, and salts, forms the protoplasm; the salt concentration is not constant, but varies considerably in different microörganisms. Protoplasm is easily injured by conditions which affect the colloids, so that substances which are able to penetrate the cell are those most likely to prove injurious. The protoplasm of bacteria is not, so far as is known, intrinsically different from that of other cells, and it might be expected that penetrating substances would affect microörganisms in the same way that they affect other tissues. But bacteria appear also to have the property of attracting to themselves certain substances either by physical processes—that is, in the same way that charcoal filters out by absorption the coloring matter from vegetable infusions—or, as Erhlich supposed, by an anchoring group which can attach itself to particular drugs. Dyes, for example, by adsorption or anchoring, are so attracted, and since these substances readily penetrate, they may kill the microorganisms without much injury to the surrounding tissues. The ideal antiseptic should, therefore, be one which will destroy all microörganisms in its sphere of action without injuring the body tissues, and the usual method of testing injury of tissue is by observation of the leucocytes in the wound; these cells are easily affected by poisons, and are certainly the cells which are easiest to examine. Observations of this nature have shown that antiseptics like perchloride of mercury (1 in 1000) or carbolic acid (1 in 20) destroy some leucocytes, but the significance of this is not great, since the proportion of microorganisms destroyed is probably out of all proportion to the injurious effect on the tissues. With some antiseptics like the hypochlorites, and certain dyes, the injurious effect on leucocytes is almost negligible.

The mineral acids and heavy metals do not destroy bacteria by direct penetration of the cell or by dissolving the lipoids, but by combination with proteins and destruction of the cell envelope. Spores are protected much more effectually than bacteria; concentrated solutions of salts, distilled water or alcohol, all readily kill bacteria, but do not kill spores even after a week's immersion. Moreover, spores are not protected by a lipoid membrane, since lipoid-soluble antiseptics, like creosote, which readily penetrate bacteria, do not affect spores.

It will be seen from this that the solubility of antiseptics in the outer layer of the protoplasm is the chief factor deciding rapidity of action and, therefore, their value. Lipoid-soluble substances are easily absorbed by bacteria, and this class includes most organic antiseptics, but none of the inorganic except perchloride of mercury and iodine. Carbolic acid dissolved in oil has no germicidal properties, because its affinity for the oil is so much greater than its affinity for cell lipoids, and even proteins diminish its action by diminishing its solubility in the cell lipoids. On the other hand, carbolic acid and the other benzene derivatives like creosols in the presence of salts are more efficient germicides, because the carbolic acid now becomes less soluble in water and the phenol penetrates the cells in larger amount. So that the efficiency of an antiseptic not only varies with the concentration and duration of action, but with the chemical composition of the medium in which it acts, and in wounds and suppurating conditions the abundance of protein present renders valueless many antiseptics such as metallic salts.

The creosols have a phenol coefficient of three or four and are less toxic to body tissues than phenol; they are usually brought into solution by soft soap. B-naphthol and its derivatives have all been

recommended from time to time as efficient antiseptics for infected wounds, but their use is now discarded, largely on account of the difficulty of obtaining a suitable solution. Combination with sulphuric acid or glycuronic acids renders the coal-tar derivatives inert; the body tissues detoxicate in this manner, and it follows that sulphonates and sulphocarbolates are valueless for antiseptic purposes.

Compounds in which some chlorine is "available" have become very popular as antiseptics, especially in the treatment of infected wounds. They have much to recommend them; they are non-poisonous, have little irritant action, and hardly affect leucocytes; they are powerful oxidizing agents and destroy toxins, and it has been frequently noted that the free application of these derivatives to infected wounds causes constitutional symptoms to disappear, though only to return when the treatment is stopped. Bleaching powder has long been known as a powerful germicide, but it was regarded as too irritant for use as an antiseptic for wounds. The addition of boric acid, however, to a solution of hypochloride renders it much less irritant, and has come to be known as eusol. The combination of hypochlorite with sodium bicarbonate is even superior to eusol; for general surgical purposes, such as irrigating wounds, the solution should contain about one-half per cent of sodium hypochlorite.

All proteins contain amino-acid groups, which, in contact with a solution of hypochlorite, react by substituting chlorine for the hydrogen of the $=NH$ group with the formation of compounds known as chloramines. The chlorination of bacteria is peculiarly deadly to them, and out of all proportion to the effect on mammalian tissues.

Hypochlorites in solution kill most pyogenic organisms in serum at a concentration of 1 in 1500. Blood when present decomposes the hypochlorites, so that as much as 1 in 300 may now be required to effect a sterilization. The sodium hypochlorite solution is especially valuable for cleansing septic wounds, but unfortunately it quickly loses its action and requires frequent renewal, for the available chlorine disappears; it has the additional advantages that it dissolves necrosed tissues, is non-poisonous, and cheap.

Certain aromatic chloramines have the great advantage over sodium hypochlorite of being stable and forming soluble sodium salts. Benzene, sodium sulphochloramide, and p. toluene sulphochloramide are practically non-irritating, and can be used in much higher concentration than the hypochlorites. Their action is similar to the hypochlorites, but they are more powerfully antiseptic. The sodium salt of the latter substance is known as chloramine-T. This body is readily soluble in water and, like the hypochlorites, attacks metals. In equimolecular solutions it is less irritant and about four times as efficient a germicide as hypochlorite. It disinfects very rapidly, the maximum effect being reached a few minutes after application. For the treatment of wounds it is best employed as a 2-per-cent solution, and the action gradually disappears as the available chlorine is used, and the more rapidly if septic conditions obtain. A 5-per-cent gauze is suitable for packing septic cavities. It is especially valuable for the treatment of infected wounds and, on account of the absence of irritation, for injuries to the mouth and jaw. Ointments made with these substances are inert.

Dichloramines have also been much advocated, but it is difficult to find solvents for them which give satisfactory solutions, and they have no advantages over chloramine-T.

Dyes and allied drugs have hardly fulfilled the high expectations anticipated for them; it will be necessary only to refer to two or three which are of undoubted value in surgery. Malachite green and brilliant green are used as general antiseptics, though used alone they are not very powerful germicides. Malachite green

as a 2-per-cent solution in 80-per-cent alcohol mixed with a 2-per-cent solution of perchloride of mercury in 80-per-cent alcohol, forms a double compound which is dissociated by the tissues. The mixture is applied as a spray, and exerts little irritant action. Acridine dyes call for more attention; they are usually termed flavines. Acriflavine is the one usually used, proflavine is the diamino derivative, and homoflavine the dimethyl derivative. All the flavines are powerful antiseptics, and have been used in the prophylactic treatment of wounds as well as in suppuration; they are said to be especially useful for the nasopharynx and for washing out cavities. The rate of disinfection is not very rapid, but these bodies have the great advantage that the presence of serum increases the germicidal action, although the presence of pus greatly retards it. They are usually used as a 0.1-per-cent solution in normal saline. Flavines are much more effective as germicides in alkaline media, and their action is enhanced by light; they are not very poisonous substances, but are certainly not innocuous, and after the absorption of large doses in animals, nephritis and pulmonary edema occur. The value of flavines in surgery has yet to be determined.

Miscellaneous antiseptics are very numerous and have no chemical relationship with one another. Hydrogen peroxide is of little value as a germicide; its action is determined by the fact that blood, pus, and tissue proteins decompose it with the evolution of oxygen, and the mechanical action of the liberated gas removes sticky adhesions and washes away pus. Permanganates, also oxidizing agents, are chiefly used for irrigation; they are mild germicides when no serum or pus is present, and are unsuitable for septic wound treatment. Iodine has much to recommend it; for disinfecting the skin a 2 or 3 per cent in alcohol acts admirably, but for wounds it is too irritating, and after constant use severe after-effects, such as neuritis, have been observed. Borates, perborates, and boric acid are only useful to prevent the growth of putrefactive organisms; they are not germicides.

Formic aldehyde is a slowly acting antiseptic; it has been used in a ½-per-cent solution for the disinfection of the hands, and to a smaller extent for mucous membranes, but it is not now used in the treatment of wounds. Iodoform owes its action to the gradual liberation of iodine in the presence of proteins, and this stimulates the growth of granulation tissue; iodoform has no germicidal properties.

No antiseptic can be regarded as the best; each has its special use; many are irritant, most are much weakened by the presence of protein, some are toxic after absorption, and some have special affinities for certain microörganisms. Few can doubt that the future of surgery in this respect lies in the laboratories of chemistry and pharmacology.

Pituitrin in Third Stage of Labor.

SEIDES *(Surgery, Gynecology and Obstetrics,* January, 1923) observes that for more than two years he has been using pituitrin as a routine at the beginning of the third stage of labor in all his obstetrical cases and has found the results to be most gratifying.

The following is the report of the procedure adopted at the Jewish Maternity Hospital and of the results observed in the first five hundred consecutive cases: Five hundred consecutive cases received each 0.5 cubic centimeter of pituitrin at the beginning of the third stage of labor. The uterus was untouched save when the medical attendant sought for the signs indicating that the placenta had left the uterus. The placenta was expelled from the vagina by the voluntary effort of the patient assisted by the medical attendant, who would span and support the recti muscles. There was one case of simple retention of the placenta, and three cases of unseparated placenta that required manual removal. The contraction of the uterus

was uniformly and perfectly maintained. The loss of blood was surprisingly small. Involution of the uterus progressed more rapidly than usual. The after-pains were, on the whole, less frequent and milder. The general health and well-being of the patients were exceptionally good.

From the above results it is evident that pituitrin, administered at the beginning of the third stage, offers the following advantages:

It considerably shortens the third stage of labor. It acts as the most effective preventive of postpartum hemorrhage, and especially in cases of protracted labor, overdistention of the uterus (hydramnios, twins), intrauterine manipulation, and where narcotics or anesthetics are employed. It reduces to a minimum the loss of blood incident to the third stage and to the period immediately following it.

It tends to lessen the amount of lochial discharge and shorten its duration. It renders unnecessary all uterine manipulation (gentle massage, kneading, and compression) employed for the purpose of encouraging uterine contractions and guarding against relaxation.

It makes Credé's manual expression of the placenta entirely unnecessary. It aids the involution of the uterus. It tends to diminish the after-pains, which are due to the accumulation of blood clots in the uterus.

Lastly, it diminishes the frequency of retained placenta. Physicians generally refrain from using pituitrin before the placenta is out as they fear that pituitrin may cause its retention. They evidently associate the action of pituitrin with that of ergot. But there is this difference between the action of the two drugs; while ergot produces a lasting tetanic contraction of the uterus, pituitrin simply intensifies the normal uterine contractions, which are intermittent. Furthermore, the factors primarily responsible for the retention of the placenta are: (*a*) spasmodic contraction of the internal os; (*b*) paralysis or atony of the fundus of the uterus; and (*c*) disturbance of the retroplacental hematoma. One or all of these factors may be created by excessive or improper manipulation of the uterus, especially when an attempt is made to express a placenta that is as yet unseparated. The use of pituitrin renders manipulation of the uterus unnecessary, hence eliminates the principal causes of the retention of the placenta.

The results obtained in the above 500 consecutive cases demonstrate conclusively that pituitrin administered at the beginning of the third stage of labor not only is perfectly safe, but also that it is of distinct benefit to the patient and of considerable advantage to the attending physician, rendering his management of the third stage simpler and safer.

Experimental Rickets.

In a leading article (*Lancet*, Dec. 23, 1922) KORENCHEVSKY's work receives favorable comment and the deductions to be drawn therefrom are summarized as follows:

A moderate deficiency of calcium can by itself produce osteoporosis which, on clinical, chemical, and morphological grounds, cannot be sharply separated from mild or atrophic rickets, and if there is a simultaneous defect in the supply of the antirachitic factor which is abundant in cod-liver oil, frank rickets ensues. If the deficiency is so great as to amount to almost complete absence of calcium, definite severe rickets results which cannot be prevented by cod-liver oil, and similarly absence of or grave defect in the antirachitic vitamin produces rickets on a diet containing an adequate supply of calcium. From which it follows that the antirachitic factor operates by influencing the capacity of the animal to assimilate calcium, and that the quantity which is necessary to prevent rickets is proportional to the amount by which the supply of calcium falls short of the optimum. A realization of these quantitative inter-relationships will go far in clearing up apparent discrepancies of experiment and experience. The conception of "limiting factors" in com-

plex etiological relationships wants more consideration than it has received. The "limiting factor" in the normal growth of bone may under one set of circumstances be calcium, and under another vitamin. Experiments show the importance of the mother's diet. It is now recognized that rickets is most liable to begin in the first months of life, possibly sometimes before birth, and adequate amounts of antirachitic factor, calcium, and phosphorus are necessary for the mother during pregnancy, and especially during lactation, for her own sake as well as the child's. Of factors other than dietetic, the author treats more briefly. His experiments on the infective hypothesis and on the influence of a moist confined atmosphere led to negative results, and into the etiological (as distinct from the therapeutic) significance of ultraviolet light he is not prepared to go further than to admit the "possible importance" of its absence. Investigations published in the present issue of the *Lancet*, however, suggest that light may act as an economizer of the growth-promoting factor, possibly identical with the antirachitic factor. Professor Korenchevsky and Dr. Mann both produce some evidence suggestive of a hereditary diathesis for rickets.

If this is the substance of controlled and simplified experiment in the laboratory, it is small wonder that there is some difficulty in getting clean-cut results in working-class houses in Southwark or Glasgow or Vienna. It may well prove a hard task to identify the respective shares of vitamin, calcium, phosphorus, light, and possibly muscular exercise and heredity in bringing a child to hospital, and still harder to name the particular cause in each example of deteriorated well-being and vigor which falls short of definite disease. Hygiene and therapeutics are, however, fortunately prepared to deal with more than one variable at a time and, by keeping all the factors far from their possible limiting values, to secure an effective control of the English disease.

Sports Injuries.

ROMER (*The Practitioner*, January, 1923) includes under this title a number of injuries which are commonly associated with definite games. As a general principle he lays down the rule that in the young and healthy people who usually suffer from these injuries prompt recovery may be expected in case the treatment be rational. This in the case of sprains or traumatic synovitis he believes should be heat, bandaging, and massage and use. Strapping he believes of distinct service, and also advises the use of the *x*-ray in making the diagnosis. The tendency to golf elbow, which may also follow fly-fishing, weeding, fencing, and the use of a heavy coaching whip, is characterized by pain around one of the condyles of the humerus which gradually grows worse until athletic use of the arm is rendered difficult or impossible. The external condyle, with its muscular attachments, is the usual seat of pain and tenderness. The faulty muscles become cramped, indurated, and painful on pressure. Occasionally distinct simple arthritis is set up in the radio-ulnar joint. These patients can lift or pull heavy weights from the ground with perfect comfort, while any small action such as pouring out tea, tying a bow tie, brushing their teeth or similar movements are exquisitely painful.

In such conditions treatment is usually successful, and consists in intelligent massage of the affected muscle group, in order to supple down the fibrotic condition. Such massage should be confined entirely to these affected muscles. Massage of the whole arm and shoulder in such a condition is quite unnecessary, unless it should be found that the muscles in such situations are also affected. During the course of massage, which ought to be daily for an average period of ten days, it is advisable for the patient to abstain from playing those games which caused the trouble. The full effects of the massage may not be appreciated by the patient until some days have elapsed.

The muscles having been suppled down by massage, the forearm ought to be strapped, with the double object of supporting the muscle and at the same time checking the pull on the condyle.

The most satisfactory way of doing this is to cut two strips of adhesive plaster about one inch and a quarter in width. The first is applied so as to encircle the forearm at the juncture of the upper and middle third. The second piece is folded on itself, and a semicircle cut from it. This is attached so as to overlap the first by a small margin, whilst the opening made by the removal of the semicircle enables the support to cover the forearm completely up to the joint without interfering with flexion. When putting the plaster on see that the elbow is simiflexed and supinated, with the muscles of the forearm relaxed. With the strapping properly attached, play can once more be resumed, and though a certain amount of discomfort may be experienced, the condition will not be aggravated but will gradually clear up. In the second variety a small swelling is often to be detected in the early stages, and should massage and radiant heat fail to cause improvement, counter-irritation or administration of iodine by ionization will sometimes be found useful.

When the radio-ulnar articulation is affected, swelling and pain over the head of the radius will be found. Massage combined with radiant heat often gives excellent results, if the patient taking his trouble in time seeks early advice, but in this condition, especially if arthritic changes are beginning, recovery seems very slow.

Rider's sprain is the title given to an injury which is very common during the hunting season. When riding it may be occasioned by the sudden swerve of the horse when jumping or galloping, but any action causing overstrain of the adductor muscles will occasion this condition. The lesion may extend from a slight sprain to almost complete rupture of any of the adductors. The adductor longus is the usual muscle to be affected, but the whole group are more or less involved. The injury may take place at the attachment of the muscles to the pelvis, or the belly of the muscle itself may be partly torn. The pain experienced is described as sickening in character, and though the patient is able to sit his horse, any attempt to grip the saddle with his knees will be rendered abortive from the pain produced. The thigh on the inner side will be found to be swollen and very painful to the touch, while careful examination will often reveal a small groove in the damaged muscle. Ecchymosis is often excessive, and in severe cases will extend down the whole length of the thigh.

The most satisfactory method of dealing with these injuries is by skilful massage, which should be directed to obtaining absorption of the extravasated blood and lymph. The length of time required to obtain this will vary according to the severity of the injury, but even in severe cases daily massage, if properly applied, will rarely be necessary after a week or ten days. In the intervals of massage ordinary walking is to be advised, but care should be taken to avoid any movement likely to cause sudden abduction of the injured thigh, such as might occur by getting out of a moving vehicle.

The swelling having practically subsided by means of the massage, the thigh should be strapped by means of adhesive plaster. This will not only give support to the injured muscles, but will assist in the absorption of any remaining effusion. Three strips of any non-irritating adhesive plaster are cut of sufficient length to encompass the thigh, and about two inches in breadth, and applied from below upwards, each succeeding piece overlapping its predecessor by about half an inch. Care should be taken that the last strip is shaped so that it fits well into the fork, but does not chafe the fold of the buttock.

Chronic rider's strain, by which is meant a strain that recurs year after year, re-

quires a slightly different form of treatment. Such cases always show atrophy of the muscles of the thigh in general, and contraction of the adductors in particular. This is occasionally so pronounced that the muscles may need stretching under an anesthetic before treatment can be successful. In less severe cases soundness will be established by overcoming the contraction of the adductors by firm massage, and by restoring the strength to the wasted muscles my means of suitable exercises. When a condition of intense rigidity is found in the adductors, a radiograph should be obtained, in order to eliminate that curious anomaly, rider's bone (myositis ossificans). In running, especially at the start of a race, people are apt to sustain a partial rupture of the hamstring muscles of the thigh, and treatment similar to that described for rider's strain gives excellent results.

Lawn-tennis calf is very characteristic in onset, and the patient usually imagines he has been sharply struck by a stone or a stick, causing exquisite pain in the leg. This pain is due to the sudden rupture of some fibers in the muscular structure of the calf. Swelling follows rapidly, and the subsequent ecchymosis is often considerable. The situation of the lesion, judged from the pain produced by examination of the leg, varies considerably, and occasionally a distinct sulcus can be detected when the injury is situated in the gastrocnemius.

The treatment briefly consists in supporting the calf muscles by means of strips of adhesive plaster of sufficient length to encircle the leg, and about one and a quarter inches in width. Starting just above the ankle-joint, care must be taken that the plaster lies flat and free of creases, each succeeding piece slightly overlapping the former. The strapping is carried above the belly of the gastrocnemius up to just below the knee. Each strip should start from behind forward, so that the ends fold over the front of the shin, till the whole looks like a well-fitting puttee. Care should be taken that the folds are level and do not sag at the back, for this is liable to cause chafing. Immediate use of the limb is essential to rapidity of cure, and before dismissing your patient see that he walks with weight on the foot, with toe-and-heel action, even at the expense of considerable pain. It should be borne in mind that, with the leg thus strapped, the pain is rarely severe, and gradually subsides. The pain, in fact, is disagreeable to the patient but harmless to the leg. The plaster should be renewed at the end of the third day, and subsequently at increasing intervals as the swelling subsides. The simplest method of removing the plaster is to insert a blunt-pointed bistoury, and cut straight up, when the plaster can be removed *en masse* with a minimum amount of discomfort to the patient. Complete recovery can be anticipated within three weeks, during which time the patient will not have been required to abstain from attending to the ordinary duties of life.

Among the injuries to the shoulder which may be met with in conjunction with games is when acute pain is experienced in front of the joint by cricketers when bowling or throwing, due to a sprain of the long head of the biceps. On examination, the tendon sheath will often be found thickened, and that a condition of tenosynovitis has arisen. Treatment consists in radiant heat when possible, and light massage, which should be confined to the affected area, general massage of the arm, fingers, and side of the neck being totally unnecessary. The inflammation, if neglected, is very liable to spread along the course of the tendon into the joint itself, and is a frequent source of subsequent adhesions in the shoulder.

Cricket is also responsible for the production of an injury that has received the cognomen of "dropped top," the condition which in America receives the title baseball finger. It arises from a blow on the tip of the outstretched finger, which causes a sudden flexion of the joint when the extensor tendon, being unable to relax in time, is split, or partly torn, at the attachment to the terminal phalanx. Pain and bruising are the obvious results, and though the

terminal phalanx can be extended readily enough by passive movement, it at once drops into the semiflexed position on the pressure being removed. When the lesion is so severe that the general utility of the finger is likely to be impaired, the question of open operation may be considered. Rest on a splint in the extended position is sometimes advised, but recovery is doubtful as regards complete voluntary extension.

Football and practically all games are responsible for injury to the knee-joint; sprained knee and the attendant acute synovitis being only too common.

In this paper it is assumed that the case is one of sprain of the joint, followed by acute synovitis, and not one of internal derangement of the knee-joint. When the joint is full and tense it is occasionally advisable to aspirate before continuing treatment. Since the most comfortable position far a full knee is that of semiflexion, the custom of fixing the knee to a flat back splint is both painful and unnecessary. Rest in bed, with the knee supported by a pillow, is all that is required, and light massage at once begun for the purpose of obtaining absorption of the extravasated fluid. In addition, evaporating lotions or an ice-bag can be applied to the joint, whilst the use of antiphlogistine will often give relief to the pain. As the fluid subsides, which it should within the course of a few days, the knee-joint will automatically resume the extended position on the pillow, and during the massage the patient should be encouraged to move it into gradually increasing flexion. When all the effusion has subsided, the patient should be encouraged to move about, the joint meanwhile being supported by either a firm bandage or, better still, by strapping, which, by placing a small layer of cotton-wool over the patella, and in the popliteal space, will enable the patient to flex and extend the knee in walking.

Amongst the young below the age of seventeen, a somewhat curious condition, called Schlatter's disease, may be met with. Pain is complained of in the front of the knee-joint over the head of the tibia. This is due to the pull of the patella tendon causing a starting of the epiphysis of the tubercle from the tibia. There is sometimes swelling, and pressure over the tubercle causes considerable pain. When rest and abstention from games prove useless, cure can be effected by open operation, and driving back the rising tubercle into place by a few sharp blows.

Acute tenosynovitis of the tendo Achillis is often set up through the habit of tying the lace of the boot too tightly round the ankle. The repeated "beat" of the tendon against this constriction during a long walk, or a day's shooting, causes swelling in the tendon sheath and great pain. When neglected, this condition is difficult to repair. Radiant heat and massage and abstention from the wearing of boots usually suffice, but where, as in the army, the use of shoes for marching was forbidden, many cases were seen in which the condition had become chronic, and considerable difficulty was experienced in obtaining soundness.

An injury that is common to all forms of sport is that of a sprained ankle. The method of treatment which is undoubtedly the most satisfactory is that of supporting the joint by strapping, and use. In order to strap the ankle, four pieces of adhesive plaster about twelve inches long, and one and a quarter inches in width, should be cut. The first strip is placed from below upwards round the ankle-joint. The second starts behind, crossing in front of the joint, over the instep. The third piece is folded on itself, and a small piece can be cut out. This strip of plaster starts from behind, as in the second, but lower down, and is brought forward below the malleoli, the small nick which has been cut out of the plaster being for the purpose of avoiding chafing the heel. The fourth piece is wrapped around, just above the ankle. A sprain of the joint being an incomplete dislocation, the tendons and ligaments are overstretched and possibly torn. The repeated tightening and loosening of the plaster in the action of walking produces

the effect of massage, whilst the support afforded by the plaster enables the patient to move about freely, and without danger. No case of uncomplicated sprain of this joint needs rest in bed. If the object of the patient is to obtain a speedy cure, he must use the ankle, and be encouraged to walk, once it has been strapped as above described, and pain will be found not so severe as is apprehended. The plaster should be renewed at the end of the third day, when it will be found to be loose, owing to subsidence of the swelling.

Practical Observations on Syphilis.

HAZEN (*American Journal of Syphilis,* January, 1923) in the course of a series of articles takes up the question of treatment of children with congenital syphilis. He holds that it is extremely important to conserve their maximum of health. If possible they should be breast-fed rather than bottle-fed. They should be carefully protected from acquiring any acute infectious disease. An abundance of fresh air and sunlight is essential.

There have been many men who have tried to treat nursing children through medication given their mothers. However, the results have not been good.

It is probably always necessary to treat the child direct with either arsphenamine or mercury. The iodides have no value in killing the treponemata, and are upsetting to the digestion, hence are no longer used. Mercury may be given by the mouth, but care must be taken not to disturb the digestion. Either the protiodide or mercury with chalk may be used. Of the latter Hazen gives from 1/2 to 1 grain three times a day. One-sixth of a grain of the protiodide a day for a young child is sufficient. The most popular form of administering mercury is by means of inunctions. The blue ointment, ung. hydrarg. fort., is the old favorite. About one drachm is rubbed over the binder nightly, and the binder then wound around the infant's body. This should be removed daily and the body washed. Intramuscular injections are favored by some, but in general they are irritating and not to be recommended.

Turning to arsphenamine and neoarsphenamine we find that in the early days a number of deaths were reported from both preparations, and it was thought that the killing of a large number of treponemata and the freeing of their toxins into the circulation might be responsible.

Older children should have arsphenamine administered by the intravenous route. Young children may receive it in three different ways either intramuscularly, intravenously, or, as a special application of the latter method, into the longitudinal sinus.

The dose by the intramuscular route should be given from once in ten days to once in two weeks, and the greatest care should be taken that it be injected into the muscle and not into the subcutaneous tissue. The upper and outer quadrant of the buttock is a suitable site for injection. Either neutralized arsphenamine or neoarsphenamine may be employed.

In employing the intravenous route it is usually preferable to elect a vein in the elbow. In certain cases a vein on the front of the scalp may be easily accessible. Many workers prefer the jugular vein, but this is thin-walled and subject to sudden collapse from changes in intrathoracic pressure, so that it is very easy to either miss the vein or to run the needle through both walls.

The use of the longitudinal sinus is mentioned only to be condemned. It is not difficult to produce an infiltration in the brain substance which may end fatally. Although the literature contains very few references to this subject, still the author knows of a number of cases where death has ensued.

In all cases of congenital syphilis the treatment must be long continued; practically never less than two years of almost continual medication. Alternating courses of arsphenamine and mercury should be employed. The physician should never be disturbed because the Wassermann fails to clear up promptly.

Reviews

INTERNAL MEDICINE. A Work for the Practitioner especially on Diagnosis and Treatment. Sixth edition, revised and enlarged. By James C. Wilson, A.M., M.D., Creighton M. Turner, M.D., and Samuel Bradbury, M.D. Vols. III. The J. B. Lippincott Co., Philadelphia, 1923; $20.

As long ago as 1909, Dr. Wilson published the first edition of his book on Diagnosis. It was quite a large and exhaustive treatise, and, as the title-page indicates, has now reached the sixth edition in a different form. The original author, assisted by Dr. Turner, has called to his aid eleven collaborators in the volumes devoted to diagnosis. Because of the arrangement of the contents of these three volumes, a consecutive review is difficult. It would appear that the original author has had little to do with the present text except in so far as it represents the original copy. The first volume on diagnosis contains 663 pages, the second 855; the third, devoted to therapeutics, contains 572 pages. None of these volumes contain an index, but this difficulty is overcome by the publication of what might be called a fourth volume, the Desk Index, which contains 203 pages, and which, therefore, is very exhaustive.

In the article on typhoid fever in Volume III, we note that the writer seems to be less enthusiastic in regard to the value of the cold bath than the senior author was a number of years ago. Adequate attention is given to the improved feeding methods which have been instituted during the last fifteen or twenty years.

Concerning so-called pluriglandular treatment, the senior author in this section states that it has been compared with the Mississippi Company and the South Sea Bubble, but evidently thinks that such a comparison is unjust because while the South Sea Bubble was a colossal scheme to defraud credulous people of money, pluriglandular therapy is a comprehensive plan for restoring ailing persons to health. In each instance the writer states that the present interest in glandular therapy is what might be called "mob psychology," and then goes on to say that pluriglandular therapy will come to its own by the use of the principles of the working hypothesis, whatever this may mean. The hope is expressed that ultimately great discoveries may be made, and the proposition is compared to the work of the prospector for gold who sometimes finds it and sometimes does not. We fail to see that there is any relationship between the matter of pluriglandular therapy and the introduction of aviation, submarine navigation, wireless telegraphy, the Panama Canal, and the telephone, but these are cited as instances of advance made through investigation.

In the List of Collaborators of Volume III we fail to find the name of Dr. Wilson or Dr. Bradbury, but on looking through the text we find that Dr. Wilson contributes the article on Tuberculosis and Dr. Bradbury that upon Syphilis; so, too, Dr. Wilson contributes the article upon Alcoholic Intoxication and Narcotic Habits, and points out that the Harrison Act, while limiting the sale of these drugs in prescriptions, has enormously increased the distribution of cocaine and heroin, which increase is as wide-spread as it is dangerous. He also states that the United States awaits with profound interest the outcome of the recent prohibition amendment and adds these pregnant words: "A law that cannot be enforced tends to wide-spread disdain of all law."

In the article upon Aneurysm, the statement is made that gold, silver or platinum wire may be used with electrolysis. We believe that this is an error, as only a wire which is made of gold and platinum coils properly in the aneurismal sac.

Among the list of collaborators we notice the names of Dr. Anspach from the Jefferson Medical College, Dr. Reid of the

Navy, Dr. Barclay of New York, and Dr. Davis of Philadelphia.

The object of this third volume devoted to Treatment has been, as pointed out by Dr. Bradbury, the editor, to provide a volume which will outline the treatment of the various diseases which have been described in Volumes I and II.

TONSILLECTOMY. By Means of the Alveolar Eminence of the Mandible and the Guillotine, with a Review of the Collateral Issues. By Greenfield Sluder, M.D. Illustrated. The C. V. Moseby Company, St. Louis, 1923. Price $5.

There is certainly no laryngologist in the United States who has made as many original contributions to his subject as has the author of this monograph. His design in preparing it has been to provide his professional colleagues with a careful and adequate description of the method which he has devised of removing the tonsils. In order to deal with his entire theme adequately he has included a discussion of the embryology, comparative anatomy, physiology and pathology of the tonsils, and has called to his aid several assistants, as, for example, Opie in pathology, a man as well known in his department of medicine as is Sluder in that of laryngology.

Some of the points which we think will be particularly interesting to our readers may be found in what he has to say in regard to predisposition to infection after tonsillectomy. Somewhat to our surprise he does not minimize the dangers so much as do other writers, and quotes Zahorsky as believing that tonsillectomy increases the tendency to bronchial and pulmonary infection, with a further statement that the child beginning his school life without the tonsils is in greater danger of acute disease than one who still has them. Dr. Sluder recognizes that many pediatricians do not agree with these views, and he recognizes that disease of the tonsils is often a most mischievous and pernicious forerunner of many more serious diseases.

We think that one of the most interesting points in connection with Dr. Sluder's book is the very judicial attitude that he takes in regard to many of the points which radical laryngologists tend to belittle.

In regard to the value of *x*-ray and radium treatment for diseased tonsils, Sluder believes that it is too soon to tell what the final decision will be, but he thinks that in cases of hypertrophy, without other factors in the case, anything that reduces their size is satisfactory. On the other hand he believes that tonsillectomy is the most satisfactory procedure where there are recurring attacks of acute follicular tonsillitis.

We also note with interest the author's view that a properly performed tonsillectomy does not impair the voice, and that those singers who think they have an impaired vocal quality after tonsillectomy probably belong to a class which did not have good vocal powers to start with and who are naturally inclined to put the blame for their ultimate failure upon the operation.

Of course Chapter VI, which describes the particular point which gave origin to this volume, is the one which is most copiously illustrated with the instruments which the author employs. These instrumental illustrations are followed by large figures showing his guillotine in position at various stages of the operation. Just before the inclusion of quite an exhaustive bibliography the author devotes half a page to what he calls an "After Thought." He believes that the percentage of disappointments after tonsillectomy is now lower than in any other surgery, and claims that the guillotine which he advocates is a perfect instrument, stating that it is too strong in its construction to be injured by a man's hands.

APPLIED PSYCHOLOGY FOR NURSES. By Donald A. Laird. The J. B. Lippincott Company, Philadelphia, 1923. Price $2.50.

We are told that this book is the result of an attempt to select from the vast literature on psychology those facts that will be of most immediate aid to nurses in understanding patients, themselves, and their fellow men as organisms that act,

think, and feel. If by this it is intended to intimate that the author wishes to stimulate the imaginative faculty of the nurse so that she can assume a correct attitude toward the mind of the patient, we can see that he has set for himself a useful purpose, but here again we come to the point to which we have referred very frequently on other occasions when reviewing books for nurses, namely, as to how much it is proper to teach the undergraduate nurse. If it is intended that at odd hours, if she has any, the nurse should peruse a volume of this kind in order in Part II to learn something about the "Biological Foundation of Behavior" and the "Origin of Man's Needs," and "How Behavior Indicates Mental Activities," with a further chapter upon "The Use and Abuse in Thought" and how to use suggestion, we presume that no objection can be raised to such a plan; but that a text of this kind should be considered as part of her undergraduate study is, we believe, distinctly an error. To those directors, or directresses, of training schools for nurses who deem it wise that their pupils should receive such instruction, this book can be commended.

THE TONSILS, FAUCIAL, LINGUAL, AND PHARYNGEAL. With Some Account of the Posterior and Lateral Pharyngeal Nodules. By Harry A. Barnes, M.D. Illustrated, second edition. The C. V. Moseby Company, St. Louis, 1923. Price $5.

Dr. Barnes has dedicated his brochure upon the tonsils, which covers a little more than 200 pages, to Dr. Councilman, lately Professor of Pathological Anatomy in the Medical School of Harvard University. His first edition appeared nine years ago. The author has thought fit to provide a second edition because several new operations have been devised, because time has given us material for a sounder judgment on the relation of the tonsils to focal infection, and also because radiation as a means of producing atrophy of lymphoid disease has appeared and is even yet on trial. He also added to the sections on operations sequels and complications, and added a number of plates illustrative of operative technique, with cuts showing the appearance of pathological tonsillar tissue under the microscope.

Our readers will remember that we have recently published in the GAZETTE matter dealing with complications arising after tonsillectomy, and have pointed out in the editorial columns the dangers which menace patients under these circumstances. Dr. Barnes quotes Moore's statistics, to which we have already referred, stating that pulmonary abscess has apparently markedly increased as a complication during the last few years, although it is not to be forgotten that there is a possibility that this increase may be due to the greater number of tonsillectomies done. The author believes in ether anesthesia rather than in local anesthesia, and in the use of a suction apparatus during the operation. He does not believe in the primary employment of morphine.

Our readers will recall that in our Symposium upon Tonsillectomy the question was discussed as to the wisdom of removing tonsils during the presence of an acute attack of tonsillitis, and that the conclusion was that this was unwise. In this connection we note with interest that Dr. Barnes, while advocating the removal of tonsils during the quiescent period, nevertheless points out that when this is done there may be a marked exacerbation of joint symptoms with a sharp rise in temperature, which of course is equivalent to stating that by virtue of the solution of continuity induced by the operation another dose of the infecting organisms may enter the blood or lymph stream.

THE CEREBROSPINAL FLUID IN HEALTH AND DISEASE. By Abraham Levinson, B.S., M.D. Second edition. The C. V. Moseby Company, St. Louis, 1923. Price $5.

Lumbar puncture, first advocated as a method of clinical medicine by Quincke and popularized in this country largely under the leadership of Osler, has come to be a

method of diagnosis of great popularity, so that even medical students and resident physicians have a tendency to resort to it when studying the symptoms and manifestations presented by patients in hospitals. The introduction of the Wassermann test, the advanced studies which have been made upon cerebrospinal meningitis, and other diseases of the cerebrospinal system, have all tended to emphasize the importance of the cerebrospinal fluid as an indicator of pathological conditions. It is not surprising, therefore, that Dr. Levinson's book upon this subject has reached its second edition in the space of four years. The volume contains a little less than 300 pages, including the index, with 65 illustrations, including 5 colored plates. It is dedicated to the man to whom "the practice of medicine constitutes an ideal rather than a profession," who "combines clinical insight and scientific research," and "who sees in medicine a science and philosophy."

The text opens with a consideration of the "history of cerebrospinal fluid," and then proceeds to a discussion of its anatomy and physiology with its distribution. In Chapter III the methods of obtaining it from the living body are considered, and in Chapter IV its physical and chemical properties when in a normal state are discussed. The author then proceeds to consider pathological cerebrospinal fluid, the methods of examining it for diagnostic purposes, and the changes which are found in it in various diseases. Lastly he takes up intraspinal therapy, dealing, of course, with meningococcic meningitis, pneumococcic meningitis, streptococcic meningitis, tuberculous and influenzal meningitis, poliomyelitis, and syphilis. He also deals with the intraspinal treatment of tetanus and chorea. The last chapter, which covers only a little more than a page and a half, consists of a summary of what the author has attempted to do in writing his text. This might well have been embodied in the Preface. The type is large, the leading heavy, and the illustrations are good. While much of the information contained in the volume can also be obtained from manuals covering the entire diagnostic field, nevertheless this volume should fill a very definite niche of its own in medical literature.

RULES FOR RECOVERY FROM PULMONARY TUBERCULOSIS. A Layman's Handbook on Treatment. By Lawrason Brown, M.D. Fourth edition, thoroughly revised. Lea & Febiger, Philadelphia, 1923. Price $1.50.

This book possesses the advantage of bearing a most happy title. As stated on its front page, it is designed for laymen, and those who have seen earlier editions will remember that the author in the space of 200 pages divides his subject into twenty-six chapters dealing with the problems of rest, food, drugs, fresh air, recreation, controlling cough without drugs, body weight, the relation of physician and patient, a few brief lines on climate, and food values. The author evidently is not kindly disposed toward alcohol or tobacco, although he admits that the latter may be used in moderation by adults.

We are somewhat amused at the following sentence: "When a patient smokes fifty cigarettes a day it is easy to picture what the 'atmosphere' in his lungs is."

Dealing with the subject of rest, the author points out that a diseased lung requires just as much rest, theoretically, as a diseased joint, and he believes that a thesis might be successfully defended which would state that in proportion as any part of the body afflicted with tuberculosis can obtain functional rest so it can be cured speedily and surely. The difficulty with all propositions involving the treatment of tuberculosis lies in the fact that almost every case is a law unto itself. The tuberculosis is not treated, but the condition of the patient can be modified favorably or unfavorably, and a treatment, dietetic, medicinal, or calisthenic, may be harmful to one patient and distinctly advantageous to another, depending on his general condition and the stage of the disease.

As we have often said before, it is a difficult thing for a medical man to write a

book for lay use, and it sometimes increases the difficulties of a practitioner to find that his patient's mind has been filled with the advice of another physician whom he has never seen. Most if not all of the dangers just indicated are avoided by the wise advice of Dr. Brown in his interesting little manual.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume II, June, 1923. Lea & Febiger, Philadelphia, 1923.

As in previous issues of Progressive Medicine for June, the volume opens with an article covering 41 pages by W. B. Coley of New York on "Hernia." This is followed by an exhaustive one on "The Surgery of the Abdomen, exclusive of Hernia" by Wilensky covering 106 pages; and this in turn by one on "Gynecology" prepared by John G. Clark covering 57 pages. The rest of the volume consists of a summarization of the literature for the year on "Diseases of Nutrition and Metabolism and on the Glands of Internal Secretion," by Elmer H. Funk, covering 90 pages. The last article upon "Ophthalmology," by Joseph W. Charles, covers 25 pages.

A TEXT-BOOK OF THERAPEUTICS. Including the Essentials of Pharmacology and Materia Medica. By A. A. Stevens, A.M., M.D. Sixth edition, reset. W. B. Saunders Company, Philadelphia, 1923. Price $6.25.

Dr. Stevens, the author of this volume, has been a most successful quiz master, lecturer and professor in medical schools since the time of his graduation, and published the first edition of this work in 1895, since which time there have been not only six editions but also many reprintings. The present edition has been prepared because he has found great advances in the literature of the subject and also because many new agents, such as benzyl benzoate, thyroxin, luminal, cinchophen, and a large number of other drugs, have obtained a position of importance since the fifth edition was published.

The book deals with drugs according to classification, and the last 200 pages are devoted to a consideration of the application of these drugs to the treatment of various diseases, thereby following a method which was first introduced in another well-known book upon Therapeutics. So far as we have been able to observe, the present edition does not separate itself markedly from other volumes dealing with this subject, but provides the practitioner with a good working manual from which he can obtain not a little assistance in his daily work.

A NURSERY GUIDE FOR NURSES AND MOTHERS. By Louis W. Sauer, M.A., M.D. Illustrated. C. V. Moseby Company, St. Louis, 1923. Price $1.75.

Our readers will remember that on several occasions we have expressed the opinion that an endeavor was being made by hospital teaching and by the compilation of text-books to provide the undergraduate nurse with a training far in excess of her needs, with the double result of causing her to be subjected to unnecessary stress and strain during her pupil days, and, secondly, with the result of imbuing her mind with the idea that she knows practically as much as the doctor. We refer to these facts because the present book is in pleasing contrast with the general run of books which are being prepared for nurses at this time. It is brief and to the point, covering 164 pages of text giving definite and specific directions as to how a nurse should care for and feed a little child; in other words, it is exactly what the author tells us in his preface he has tried to make his book, namely, a brief nursery guide intended to aid those to whom are entrusted the care and feeding of infants.

Notes and Queries

A Unique Athletic Achievement.

The *Lancet* of March 10, 1923, states that a medical correspondent writes from Vienna as follows:

"Medical circles have recently been astonished and diverted by the extraordinary muscular strength of an athlete of Jewish extraction, Breitbart by name. This phenomenon is thirty-four years old, 6 feet 3 inches in height, and weighs 95 kg. His muscles are remarkably developed, particularly the biceps and forearm, chest, and thigh muscles; he is also very handsome and well built. He can easily bend iron rods into horseshoes, or twist them into corkscrew shapes; he can bite through an iron or steel chain a fifth of an inch thick, lift huge weights, or place an anvil on his chest and allow iron to be hammered on it. A committee of experts—physicians, engineers, smiths, and presidents of athletic corporations—recently investigated his abilities, as the credibility of his feats was doubted, and as a girl of nineteen years also claimed to be able, under hypnotic influence, to accomplish similar feats. The committee first examined the girl, who, it was alleged, could perform these tasks only under hypnosis. She was able to bend and twist iron rods about one-third of an inch thick, but her strength was regarded as nothing extraordinary, some of the committee also being able to perform her feats, and no necessity for calling hypnotic or supernatural forces into play was recognized, it being merely a matter of training. With the 'modern Samson' it is an entirely different thing. Whilst, for instance, the normal pressure of a masticating molar tooth is about 25 kg., to bite through a steel chain requires immense force. Exact examination proved that the athlete accomplished this feat upon several chains, more by torsion of the link than by actual biting. He was then given rods of iron, about half an inch square, two meters long, which he bent into a circle by quick pressure of his hands, using the mouth as a fulcrum. This circle he then bent further into a spiral by pulling one end across the other. Here he used not only the arms, but also the pressure of the body, thus bringing into action first the scapular, supra- and infra-spinal and pectoral muscles, afterwards the abdominal muscles, together with the biceps and the forearm muscles. Pressure by the latter was measured and found to amount to 120 kg. in this experiment. In bending short, broad (1½ in.) hoops into a horseshoe, he used his quadriceps cruris as a fulcrum, then exerted pressure by means of the adductor muscles of the thigh, placing his hands between his knees. The most remarkable achievement, however, is the following: A rail 10 meters long, 10 cm. (4 in.) thick, and 6 cm. (2½ in.) broad is placed on top of his head. A dozen people hang on to each side of this rail and try to bend it over his head. With a quick short jerk the athlete succeeds in bending it. Other feats, as lying flat on a bed of nails about half an inch apart, with their points up, are not extraordinary, but he is able to drive with a single stroke of his fist, without a hammer, a nail completely into a board one inch thick after first biting off the point of the nail. The feats have been demonstrated so often and so uniformly to experts that there is no trace of a doubt left. The committee are satisfied that he accomplishes these tasks by means of extraordinary muscular power, coupled with excellent scientific training and exceptional muscular synergy."